THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXIII. No. 568.] LONDON, MARCH 31, 1874. [26TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—10,000 cubic feet of gas per ton of coal; 25-candle gas; 13¼ cwt. coke per ton of coal.
The London Exhibition in 1851 was lighted with gas made from Ramsay's Cannel.
RAMSAY'S PATENT CONDENSED COKE.
DO. GARESFIELD COKE.

RAMSAY'S FIRE-CLAY ARTICLES.
GAS-RETORTS, introduced 1828. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.
Manufactories—Derwenthaugh, Swalwell, and Hebburn Quay, near Newcastle-on-Tyne; and London Wharves—Falcon Wharf, No. 80, Bankside; and Honduras Wharf, Cubit Town. Large stocks kept.
Address G. H. RAMSAY, NEWCASTLE-ON-TYNE.

GENUINE TORBAY PAINT
AND
ANTI-GALVANIC PAINT.
FOUR PRIZE MEDALS.
WORKS: BRIXHAM, TORBAY.
These Paints are now used in 100 Country Gas-Works, and by all (but one) of the London Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. They will cover tar effectually. Also used by the Admiralty, War Office, Railway Companies, Founders, &c.
They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov.* 2, 1866.
STEVENS AND CO.,
London Office, 21, Great Winchester Street, E.C.

HENRY SKOINES,
PATENTEE & CONTRACTING GAS ENGINEER
FOR
SETTING RETORTS,
ERECTING AND REMODELLING
GAS-WORKS OF ANY EXTENT,
AT HOME OR ABROAD.
ADDRESS—
, ARGYLE ST., KING'S CROSS, LONDON, W.C.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS-RETORTS and OTHER OBJECTS in FIRE-CLAY," and they were also awarded at the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS-RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
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Coal Office,
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JOHN RUSSELL AND CO.,
THE OLD TUBE-WORKS, WEDNESBURY
AND
THE ALMA WORKS, WALSALL.
Established at the commencement of Gas Lighting.
WAREHOUSES:
69, UPPER THAMES STREET; COMMERCIAL STREET, SPITALFIELDS; 5, CHARLES STREET, SOHO; and 16, SOHO SQUARE, } LONDON
35, 36, 37, & 39, GRANBY ROW, MANCHESTER.
J. R. and Co. are the original manufacturers of Wrought-Iron Gas Tubes and Fittings, and Inventors of the LAP-WELDED TUBES for Locomotive and Marine Boilers.
J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water; Gun-Metal Cocks, Stocks, and Dies; Galvanized Tubes and High-Pressure Tubes, &c.
Lists may be obtained on application to
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JOHN BENT & SON,
BELL BARN ROAD, BIRMINGHAM,
MANUFACTURERS OF
WET AND DRY GAS-METERS,
OF
FIRST-CLASS MATERIALS & WORKMANSHIP;
Also, STATION-METERS, PRESSURE-GAUGES, STREET-LAMPS, REGULATORS, &c.
ESTABLISHED 1830.

THOMAS PIGGOTT & CO.,
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MANUFACTURERS OF
TELESCOPIC & SINGLE GASHOLDERS,
CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
SUGAR, SALTPETRE, AND ALL KINDS OF PANS.
Roofs, Girders, and Bridges, and General Smith's Work.
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SCOTTISH CANNEL COAL.
J. & W. ROMANS, Consulting Gas Engineers and Coal Factors, of Edinburgh and London, CONTRACT for supplying any quantity of COAL and CANNEL.
They are also Contractors for leasing Gas-Works, for supplying, erecting, or repairing gas apparatus and fire-clay goods.
Messrs. ROMANS, being lessees of several Gas-Works, have their Cannels tested in the ordinary working process, thus securing for their customers a guarantee beyond mere laboratory experiments.
Analysis, prices, and other information will be forwarded on application to their Offices, 8, Forth Street, EDINBURGH; 1, Walbrook, Mansion House, LONDON, or to the "Crown Wharf," Thomas Street, Limehouse, LONDON, where stocks of house, steam, and gas coal are always on hand.
Coal, machinery, fire goods, &c., shipped to all parts of the world.

THE
DUKE OF HAMILTON'S
LESMAHAGOW
CANNEL COAL.

AGENT:
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GEORGE GLOVER & CO.,

PATENTEES OF THE
NATIONAL STANDARD GASOMETERS
For the English Government, and for the Government of the Netherlands;
MAKERS OF THE DUPLICATE COPY
Presented by Her Majesty's Government to the French Government;
AND MANUFACTURERS OF
IMPROVED
DRY GAS-METERS,
Warranted to Measure correctly, and not to vary.
RANELAGH WORKS, RANELAGH ROAD, PIMLICO, LONDON, S.W.;
236, GEORGE STREET, GLASGOW; AND 15, MARKET STREET, MANCHESTER.

G. G. and Co. have just received the only Medal awarded for Gas-Meters at the Vienna International Exhibition.

SILVER MEDAL, PARIS EXHIBITION, 1867.

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ALBION TUBE-WORKS, BIRMINGHAM,

MANUFACTURERS OF

WROUGHT-IRON TUBES AND FITTINGS

AND

LAP-WELDED IRON AND HOMOGENEOUS METAL BOILER TUBES.

Boiler-Tube Ferrules, Gun-Metal Gland Cocks, Water-Gauges, Whistles, &c.; Stocks, Taps, and Dies for Screwing, and Gas-Fitters Tools.

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LIVERPOOL: No. 63, Paradise Street. | PARIS: No. 38, Rue du Chateau d'Eau.

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Successor to the late BENJAMIN WHITEHOUSE,

(ESTABLISHED IN 1765,)

BOILER AND GASHOLDER WORKS,

Westbromwich, near Birmingham.

MANUFACTURER OF TELESCOPE AND SINGLE GASHOLDERS,

WROUGHT & CAST IRON TANKS

FOR DITTO,

PURIFIERS, CONDENSERS, SCRUBBERS, HYDRAULIC MAINS,

And all kinds of GAS APPARATUS.

Wrought-Iron Roofs, Bridges, and Girders; Steam, Hot Water, and Range Boilers; Tanks, Cisterns, &c.,

And all kinds of Wrought-Iron Work.

DRAWINGS, SPECIFICATIONS, and ESTIMATES FURNISHED.

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HENRY HOWARD & CO.,

COOMBS WOOD PATENT TUBE-WORKS.

OLD HILL, near DUDLEY,

MANUFACTURERS OF

HOWARD'S PATENT IMPROVED WROUGHT-IRON TUBES,

FOR GAS, STEAM, AND WATER;

Also ORDINARY WELDED WROUGHT-IRON TUBES and FITTINGS,

FOR GAS, STEAM, & WATER, EITHER BLACK, GALVANIZED, OR ENAMELLED.

CORE BARS FOR IRONFOUNDERS, STOCKS, TAPS, AND DIES, IRON COCKS, &c.

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CONSUMERS WET METERS,

IMPROVED DRY METERS, STATION-METERS, GOVERNORS.

PATENT LAMP-REGULATORS,

EXPERIMENTING METERS, PRESSURE-GAUGES, &c.

WHITEHOUSE AND COMPANY, LIMITED,

GLOBE TUBE-WORKS, WEDNESBURY; & VICTORIA TUBE-WORKS, GREAT BRIDGE, STAFFORDSHIRE,

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FOR GAS, STEAM, AND WATER;

GAS-FITTERS TOOLS, STEAM COCKS, AND ALL KINDS OF JOINTS.

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FLETCHER AND MURPHY,

GARRATT STREET WORKS, OLDHAM ROAD, MANCHESTER;

Manufacturers of

IMPROVED CONSUMERS WET GAS-METERS

IN CAST-IRON CASES,

THE UNVARYING WATER-LINE GAS-METER,

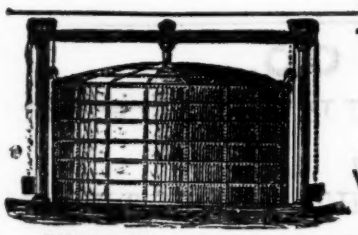
AND

IMPROVED DRY GAS-METERS;

STATION-METERS OF ALL SIZES, with PLANED JOINTS;

GOVERNORS, PRESSURE AND EXHAUST REGISTERS, TEST HOLDERS,

And all kinds of Experimental Gas Apparatus.



W. C. HOLMES & CO.,

WHITESTONE IRON-WORKS, HUDDERSFIELD

MANUFACTURERS OF

RETORTS, ANNULAR AND PIPE CONDENSERS,

WROUGHT AND CAST IRON SCRUBBERS, PURIFIERS,

GASHOLDERS,

GOVERNORS, AND ALL THE NECESSARY FITTINGS FOR COMPLETING THE ERECTION OF GAS-WORKS.

STATION & CONSUMERS WET OR DRY METERS, STREET & SERVICE MAINS, LAMP COLUMNS & BRACKETS, & WROUGHT-IRON TUBES AND FITTINGS; WROUGHT-IRON ROOFS FOR ANY SIZE OF BUILDINGS.

Sole Makers of B. W. Thurston's Combined Condensing, Scrubbing, and Washing Apparatus,

AND PATENTEES OF THE IMPROVED COMBINED CONDENSING AND PURIFYING APPARATUS SO EMINENTLY ADAPTED FOR EXPORTATION.

REFERENCES TO UPWARDS OF 300 GAS-WORKS.

Established

1795.

JOSEPH CLIFF & SON,

THE ORIGINAL

WORTLEY FIRE-BRICK WORKS,

NEAR LEEDS,

MANUFACTURERS OF ALL DESCRIPTIONS OF

FIRE GOODS, and Salt-Glazed Drain-Pipes.

LONDON WHARF:

Wharf No. 4, inside Great Northern Goods Station, King's Cross, N.;

LIVERPOOL—1, Back Leeds Street,

Where is always kept a Stock of Retorts, Fire-Bricks, Terra Cotta Ware, and Drain-Pipes.

THE IMPERIAL METER COMPANY, LIMITED,

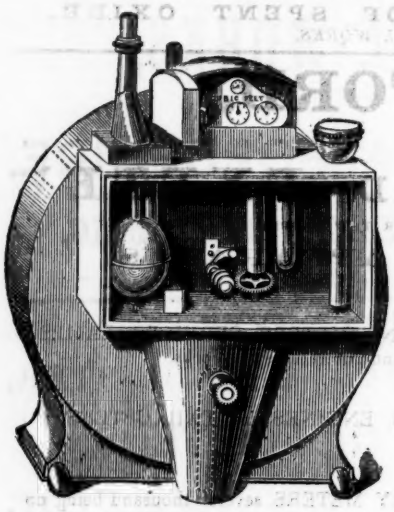
MANUFACTURERS OF

WET AND DRY GAS-METERS,

PRESSURE-GAUGES AND GOVERNORS, AND STREET-LAMP REGULATORS.

FACTORIES:

KING'S ROAD, LONDON, N.W., and GRAY'S INN ROAD, LONDON, W.C.



Front View.

THE

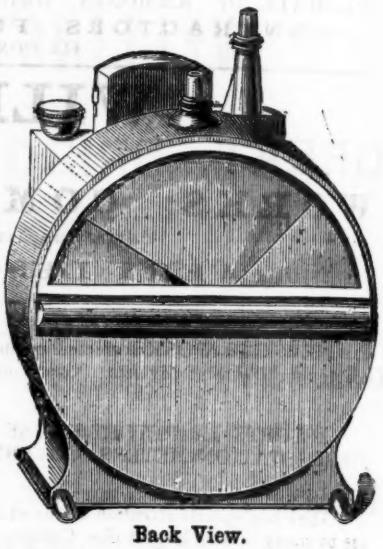
IMPERIAL

COMPENSATING

WET GAS-METER.

DE CASTRO & BURTON'S

PATENT.



Back View.

I. This Meter is more simple in construction than the common non-compensating Meter.
II. An unvarying water-line is maintained.
III. No amount or kind of pressure will cause it to "flood."
IV. It is practically unaffected by "tilting."
V. The friction is less than in any other Meter; and
VI. It will last for twelve months without requiring to be refilled.

THE IMPERIAL METER COMPANY, LIMITED, ALSO MANUFACTURE COMMON NON-COMPENSATING WET GAS-METERS OF ALL SIZES, BOTH IN TIN AND CAST-IRON CASES.

SPECIAL ATTENTION

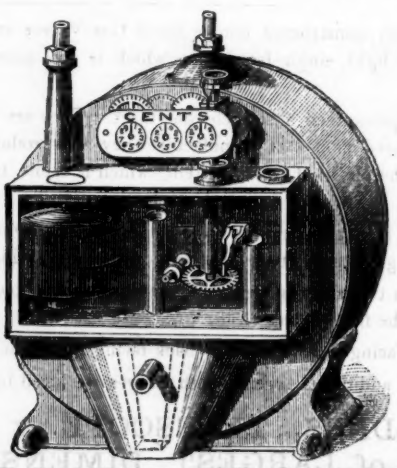
IS PAID TO THE

MANUFACTURE OF

STREET-LAMPS

AND

REGULATORS.



THE IMPERIAL WET GAS-METER.

Non-Compensator.

STATION-METERS

WITH PLANED JOINTS,

AND

GOVERNORS,

MADE TO ORDER.

Mr. GEORGE MACKANESS will represent this Company in the Provinces.

OFFICES: 41, FLEET STREET, LONDON, E.C.

W. MOORE, Secretary.

☞ *All Communications to be addressed to the Secretary.*

LIME SUPERSEDED
IN THE
PURIFICATION OF ILLUMINATING GAS,
BY
Spence's Patent Dry Copperas,

The only Purifying Material which removes, by one process, all Ammonia and Sulphuretted Hydrogen. It has been in use for upwards of four years at some of the largest Gas-Works in the Kingdom.

TESTIMONIALS SENT ON APPLICATION.

SPENCE BROTHERS CHEMICAL COMPANY, LIMITED,
VICTORIA CHEMICAL WORKS, ASHTON NEW ROAD, BRADFORD, MANCHESTER,
Manufacturers of SPENCE'S PATENT DRY COPPERAS; GREEN COPPERAS;
SPENCE'S PATENT GAS DEODORIZER;
SULPHATE OF AMMONIA, GREY AND BROWN; SULPHURIC ACID; MUDIE'S DISINFECTANT, &c.
CONTRACTORS FOR THE PURCHASE OF SPENT OXIDE.
ALL COMMUNICATIONS TO BE ADDRESSED TO THE WORKS.

WILLEY AND FORD,
GAS ENGINEERS,
WORKS: COMMERCIAL ROAD, EXETER,

INVITE THE ATTENTION OF GAS COMPANIES AND OTHERS FOR THE SUPPLY OF

EVERY DESCRIPTION OF GAS APPARATUS.

ENGINEERING DEPARTMENT.

NEW GAS-WORKS erected complete. Plans and Estimates furnished. MAINS, METERS, SERVICES, LAMPS, &c., adapted for Towns of any size. Gas Companies advised on Improvements, Extensions, and Alterations of Works.

GASHOLDERS AND TANKS.

RETORTS and RETORT-HOUSE FITTINGS, CONDENSERS, SCRUBBERS, ENGINES and EXHAUSTERS, PURIFIERS, STATION-METERS, GOVERNORS, VALVES, &c.

METER DEPARTMENT.

They beg special attention to the excellence and superiority of their WET and DRY METERS, several thousand being now in use by many of the largest Gas Companies in the West of England and South Wales. Warranted to measure correctly, and not to vary. Their acknowledged superiority has brought them into general use more rapidly than any Meters hitherto manufactured. A guarantee of Five years tendered with each Meter.

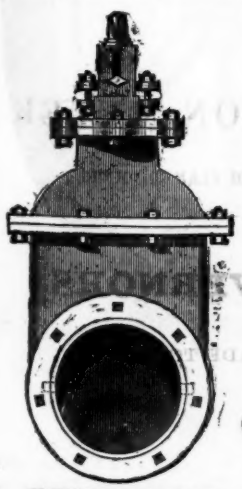
GAS-FITTING DEPARTMENT.

An extensive variety of Choice Designs in CHANDELIERS, PENDANTS, BRACKETS, STAR and SUN LIGHTS, MEDIÆVAL FITTINGS for CHURCHES, &c.
PATTERN-BOOKS and PRICE LISTS furnished.

☞ PLEASE NOTE THE ADDRESS—

GAS ENGINEERING WORKS, COMMERCIAL ROAD, EXETER.

C. & W. WALKERS' DOUBLE-FACED GAS-VALVES.



These solidly constructed double-faced Gas-Valves are superseding the old system of the light, single-faced disc, which is too uncertain and unreliable in large bores.

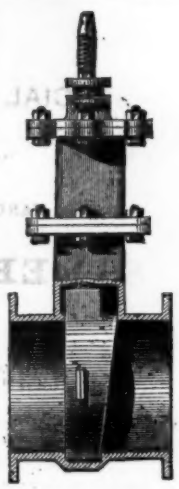
They are guaranteed absolutely gas-tight. They are very massive and rigid, and by improved modes of manufacture they are produced at very little excess in cost over the old light, weak system, which is liable to spring and bend, and become leaky.

The Valve is a rigid wedge of solid cast iron, having two perfectly scraped surfaced facings fitting between the two on the body, which are also surfaced.

A spring in two short halves, and, therefore, not liable to break, is used only for scraping the front facing clean.

The front facing is vertical; the back facing forms the wedge.

At a slight additional expense both flanges are faced to bolt to main-pipes.



GASHOLDERS, TELESCOPE & SINGLE-LIFT, of LARGEST DIMENSIONS.

PURIFIERS, SCRUBBERS, CONDENSERS of most Improved Description.

WOOD SIEVES FOR PURIFIERS,

Which have now been in use for more than ten years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

MIDLAND IRON-WORKS, DONNINGTON, near NEWPORT, SHROPSHIRE; 8, FINSBURY CIRCUS, LONDON.

GEORGE WALLER & CO.,

GAS ENGINEERS AND CONTRACTORS,

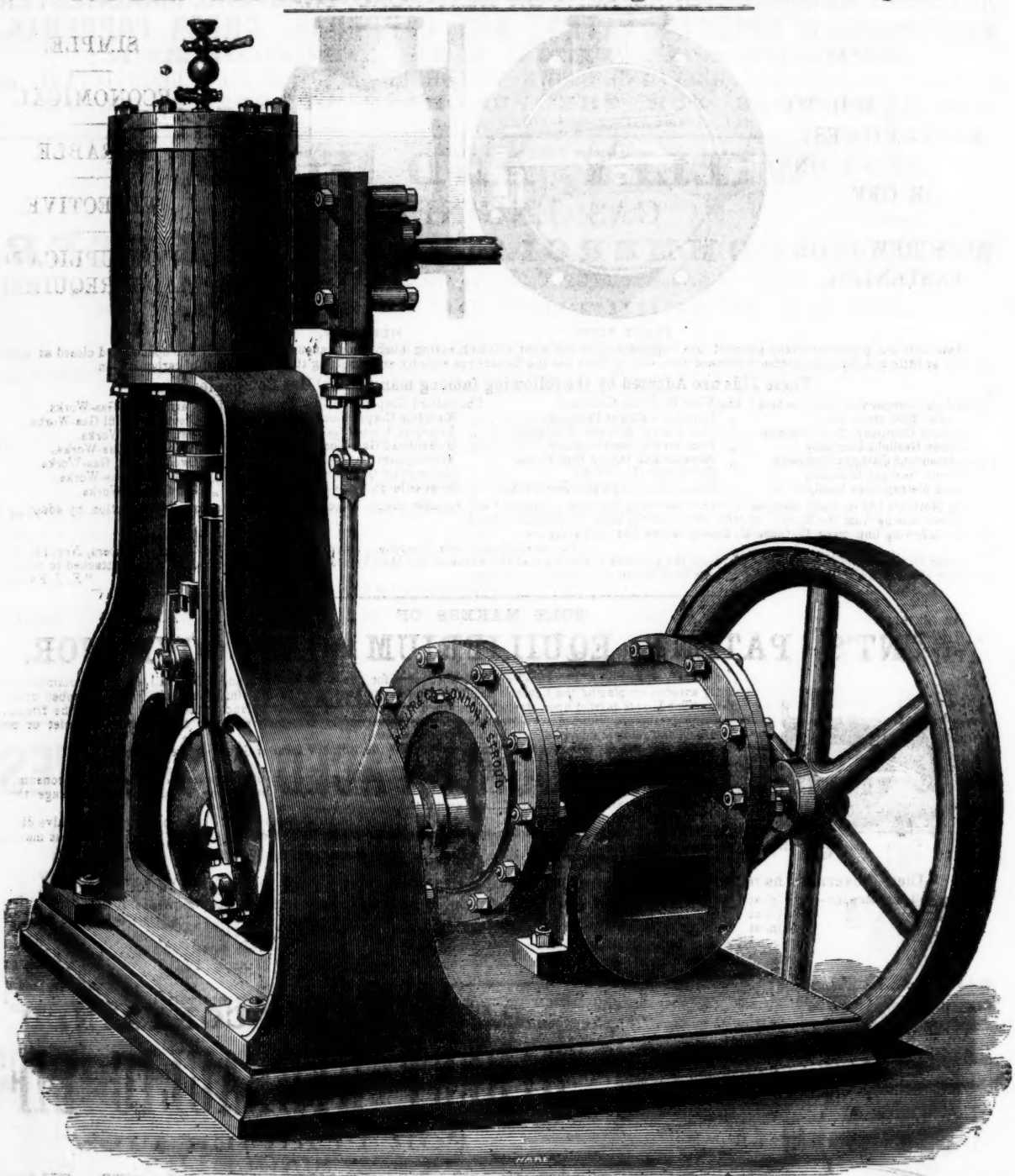
SOLE MAKERS OF

Beale's Improved

PATENT GAS-EXHAUSTERS AND COMBINED ENGINES,

ON ONE BASE PLATE.

NOTE.—The Exhausters are extra large for moderate speed.



This COMBINED VERTICAL ENGINE and EXHAUSTER was specially designed by G. WALLER AND CO. for small works, where space is an object, and is applicable for Exhausters from 1000 to 15,000 per hour. This is the *only* Engine and Exhauster **complete on one Base Plate,** requiring only one foundation.

NOTE.—They are sent away complete, and are easily fixed.

PHŒNIX ENGINEERING WORKS, HOLLAND STREET, SOUTHWARK, S.E.,

AND AT

STROUD, GLOUCESTERSHIRE.

TANGYE BROTHERS AND HOLMAN,

LAURENCE POUNTNEY LANE, LONDON, E.C.,

SOLE MAKERS OF

MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

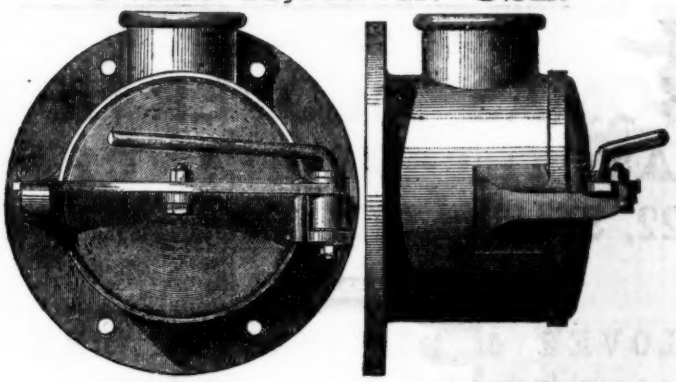
HOLMAN'S PATENT ECCENTRIC FASTENINGS.

OVER 10,000 IN USE.

NO LUTING.

LIDS HINGED TO MOUTHPIECES; NO LIFTING ON OR OFF.

NO SCREWS FOR FASTENING.



FRONT VIEW. SIDE VIEW.

SIMPLE.

ECONOMICAL

DURABLE

EFFECTIVE.

NO DUPLICATE LIDS REQUIRED.

These Lids are proved by many eminent Gas Engineers to be the most efficient, saving much time, labour, and expense; are opened and closed as quickly and with as little trouble as an ordinary furnace door, and by their use the Retorts are soundly sealed during the whole period of carbonization.

These Lids are Adopted by the following (among many other) Gas Companies:—

The Gaslight Company, Beckton (where over 2000 are in use).	The West Ham Gas Company.	The Salford Corporation Gas-Works.	The Carmarthen Gas-Works.
" Gaslight Company, Bow Common.	" Imperial Gaslight Company.	" Rochdale Corporation Gas-Works.	" Merthyr Tydfil Gas-Works.
" London Gaslight Company.	" Gas-Works, Arsenal, Woolwich.	" Liverpool United Gas-Works.	" Ystrad Gas-Works.
" Independent Gaslight Company.	" Commercial Gas Company.	" Birkenhead Gas-Works.	" St. Alban's Gas-Works.
" Phœnix Gaslight Company.	" Alliance and Dublin Gas-Works.	" Birmingham Gas-Works.	" Over Darwen Gas-Works.
" South Metropolitan Gaslight Co.	" Edinburgh Gas-Works.	" Nottingham Gas-Works.	" Aylesbury Gas-Works.
	" Manchester Corporatn. Gas-Works.	" Newcastle-on-Tyne Gas-Works.	" Cardiff Gas-Works.

The Morton's Lid is made circular in form, that being the most convenient and suitable shape. It can be used for Retorts of any section, by adapting the Mouthpiece casting from the D, oval, or other shape, at the back, to circular in front.

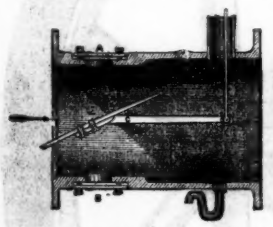
The following important Testimonial, among others, has been given:—

"*The Gaslight and Coke Company. Engineer's Office*, 6, *Westminster Chambers, Nov.* 14, 1871.

"Dear Sir,—In reply to your inquiry, I have the pleasure of stating that the whole of the Mouthpieces at Beckton have Morton's Lids attached to them, and they have given us every satisfaction. We have 2160 in use.—I remain, yours truly, (Signed) "F. J. EVANS."

SOLE MAKERS OF

HUNT'S PATENT EQUILIBRIUM GAS GOVERNOR.



In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown at C on the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

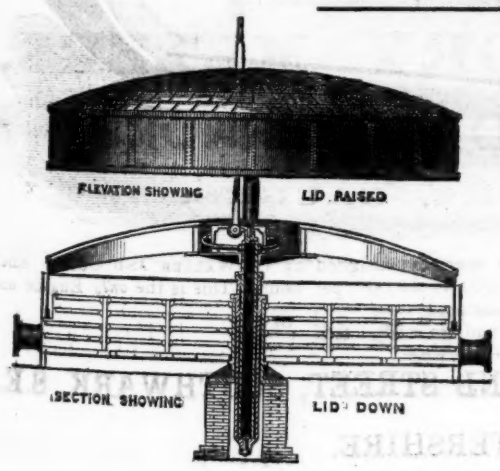
The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide Valve direct in the main; and the holder can be placed at any convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by several leading Gas Companies, among whom are the following:—

The Gaslight Company—a 24 in. at Whitechapel District Station.	The Gaslight Company—a 6 in. at the Gas-Works, Beckton.
" " a 36 in. at Goswell Road Station.	The London Gas Company—an 18 in. at the Gas-Works, Nine Elms.
" " a 24 in. at " "	" " an 8 in. at " "
" " a 24 in. at the Gas-Works, Beckton.	" " a 24 in. at " "

Also at the Gas-Works, Rochdale, Monmouth, Devonport, Cannes, and Mentone (France), &c.



PATENT SELF-CONTAINED

DIRECT HYDRAULIC LIFT

FOR PURIFIER LIDS

REQUIRES NO TRAVELLERS, CRANES, CHAINS, OR OTHER GEAR.

SAFE, SIMPLE, AND DURABLE.

ANY SIZE LID MAY BE RAISED BY ONE MAN

Eight Hydraulic Lifts have been applied at Beckton Gas-Works to raise the Covers of the large Check Purifiers, which are 40 feet diameter, during the past three years, with perfect success.

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CONTENTS.

Circular to Gas Companies:— PAGE
Parliamentary Notes . . . 429
Discontinuance of Cannel Gas in the Western District of the Chartered Company 429
The Meeting of the Municipal Corporations Association . . . 429
Terms of Purchase of the Birmingham Gas Companies . . . 429
Board of Trade Inquiry at Southport . . . 430
The Alliance and Dublin Gas Company . . . 430
Meeting of the West of Scotland Association of Gas Managers . . . 430
Reduction in the Price of Gas at Whitehaven . . . 430

Leading Articles:—
Water and Sanitary Notes . . . 430
Margate Drainage Competition . . . 431
A Treatise on the Science and Practice of the Manufacture and Distribution of Coal Gas . . . 431

Correspondence:—
The True Principle of the Valuation of Gas Coal . . . 432
"London" Argands *v.* Silber Burners . . . 433

Legal Intelligence:—
Rolls Court—Enfield Local Board of Health *v.* Harrison—Harrison *v.* Enfield Local Board of Health . . . 434
Mansion House Police Court—The Steam Stoker Company, Limited—Proceedings against the Directors for a Breach of the Companies Act, 1862 . . . 434

Parliamentary Intelligence:—
Progress of Bills in House of Lords . . . 435
Progress of Bills in House of Commons . . . 435

Miscellaneous News:—
Proposed Transfer of the Birmingham Gas Companies to the Corporation of Birmingham . . . 435
Meeting of the Crystal Palace District Gas Company . . . 439
City of London Gas Act, 1868—Board of Trade Commission . . . 441
Gas and Water Works Facilities Act, 1870, Amendment Act, 1873—Board of Trade Inquiry: Stockport (Corporation) Gas . . . 448
Meeting of the Sheppy Gas Company . . . 451
Proposed Purchase of the Nottingham Gas-Works by the Corporation . . . 452
Metropolis Gas Supply . . . 452
Metropolis Water Supply . . . 452
The Sewage of Leicester . . . 452
Whitehaven Gas Supply . . . 453
Cheltenham Water-Works Company . . . 453
Presentation to Mr. A. H. Wood, of Hastings . . . 453

Register of New Patents:—
Applications for Letters Patent . . . 453
Grants of Provisional Protection . . . 453
Notices to Proceed . . . 453
Patents which have passed the Great Seal . . . 453

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

We have received communications from the following correspondents, which we are reluctantly obliged to preserve for our next number:—R. H. Patterson, Adelphi; Peter Simpson, Rugby; D. A. Graham, Stalybridge; J. S., Lampeter; W. Key, Dumbarton. *As a rule, it is impossible to insert, in the current week's issue, letters which only reach us on Monday morning.*

S. B. D., Shrewsbury.—*Your communication has not been lost sight of, but the length of our reports this week necessitates its postponement.*

"Gas Manager's Handbook."—*The second edition will be ready for delivery on Thursday morning.*

NOTICE TO SUBSCRIBERS.

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THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MARCH 31, 1874.

Circular to Gas Companies.

PARLIAMENT has now begun work in earnest, and several gas and water Bills have been read a second time. The committee work will commence immediately after the Easter holidays. A petition has been presented for the reinsertion of the Metropolis Gas Bill in the "general list of petitions," and the Imperial Company have petitioned against the reinsertion—a piece of flattery which Mr. Flintoff will duly appreciate. The Dublin Gas Bills make their first appearance in the House of Lords, and, it might be said, are at the mercy of Lord Redesdale. They are certain, however, to receive due consideration in the hands of his lordship, who, however hard upon a company, can never be said to be unjust.

The Chartered Company have issued a notice that they will discontinue the manufacture of cannel gas at their Kensal Green station, and substitute common gas, on the 30th of June next. We feel certain that the change will give complete satisfaction to consumers. Rich gas is very rarely consumed to advantage, and in the western district, we believe, the chief result of it has been prematurely blackened ceilings. In Scotland, as will be seen below, they go to the opposite extreme, and overburn their cannel gas. An enterprising and intelligent gas-fitter, who knows how to choose a good burner, will soon have an excellent field of operation in the district.

The Association of Municipal Corporations, or Sir Joseph Heron's Association, as we may call it—for he had nearly all the talk—have just held their annual meeting, and have resolved to press upon the Government the necessity of amending the Municipal Corporations (Borough Funds) Act. Although we do not hesitate to admit that the operation of the Act at Liverpool has been disastrous, we are still strongly of opinion that the expenditure of corporate funds should be under the direct control of the ratepayers. In municipal matters, as in general politics, we can only hope that a better education will in time guide the people to right decisions. At the present moment one thing is clear, that the ordinary ratepayer takes very little interest in the election of his corporate representative. If he votes at all, it is for a friend, or a friend's friend, and he seldom considers the opinion of the candidate on questions that may be brought before the council. An appeal there must be, and that appeal can only be to the people. That is true self-government. The deputation, who have had an interview with the Home Secretary, were not strongly encouraged to hope for an immediate alteration in the Act.

The speech of the Mayor of Birmingham, at the meeting of the Town Council, reported in another column, sets forth at some length, and with much clearness, the terms arranged between the Corporation and the gas companies. It may be well, however, to summarize them here for the benefit of busy readers. Taking, first, the case of the Birmingham and Staffordshire Company, we find that the purchase is to be made by the issue to the shareholders of perpetual annuities equal to maximum dividends. The company are to retain the reserve-fund of over £40,000, and a very proper claim has been made and conceded for £10,906, a sum realized as premiums on the sale of shares, which has been employed as capital, but did not bear interest. There is, therefore, the amount of £50,000 to be distributed among the shareholders as a sort of bonus. A further sensible arrangement is that the £4 due on the last issue of shares is to be called up, which will bring the Corporation some £50,000. Deducting the sum of £10,906 which has to be paid to the company, it will be seen that this final call will bring to the Corporation some £40,000 for working capital, which they must otherwise have borrowed. The directors of the company very properly endeavoured to obtain payment of annuities free from income-tax, like the dividends, but this the Corporation would not concede. The result to the shareholders is, that they are guaranteed in perpetuity maximum dividends, subject to income-tax so long as the tax lasts, and will receive a small bonus. These terms, as we have said before, are fair, but not liberal.

In the case of the old Birmingham Company, the terms are different. The purchase is to be made by an immediate cash payment of £450,000. As the present paid-up capital of the company is £300,000, the purchase-money amounts to a premium of 50 per cent. on the share capital. The Corporation somewhat meanly stick to a small reserve-fund of £6000, which the company have accumulated, so the shareholders receive no bonus. We have no hesitation in saying that the old company have been hardly treated. They have practically been compelled to sell at a disadvantage. If left alone, the undertaking would, in another year or two, produce full dividends. In the hands of the Corporation it will at once yield a rate of profit equal to that produced by the other undertaking. We cannot, therefore, help thinking that the shareholders in the old company were equitably entiled to annuities equal to full dividends; but, in this case, the Corporation would have been justified in confiscating the reserve-fund. As a shareholder has observed, the undertaking is being sold remarkably cheap.

We may turn to the mayor's speech to learn what profits he expects the Corporation to make by carrying on the undertakings. In the case of the Birmingham and Staffordshire Company, he estimates that the total liabilities of the Corporation in respect of that undertaking will be £58,290 per annum, while the future profit of the company is estimated at £63,983; which will give the Corporation a surplus of £5693. Adding to this some savings in the shape of directors fees and some other sums, Mr. Chamberlain calculates that the immediate surplus profit from that undertaking alone will be £9000 a year. In the case of the old Birmingham Company, he calculates that, if the Corporation borrow the purchase-money at 4 per cent., which they assuredly may, the surplus profit from this, the smaller undertaking, will amount to £10,240 per annum. Is it not clear from this that the undertaking is worth considerably more than the Corporation are about to pay for it?

The immediate profit the Corporation expect to make from the combined undertakings is £20,000 a year, and it is calculated that in the course of 14 years they may produce £55,000 a year—that is, if the gas consumers in Birmingham will allow it. There are, we know, some gentlemen on the Corporation who

hold, with ourselves, that gas profits made by local authorities should be applied in reduction of the price of gas to consumers. To this it is replied that, as all ratepayers may be considered parties to the purchase, and may be, to some extent, liable if the undertaking should not succeed, all are entitled to participate in the profits. This argument, whatever it may be worth when a doubtfully profitable concern is taken over, is worth nothing in the case of these purchases. There is here no pretence for saying that a risk is incurred on the part of the ratepayers. The Corporation take over two going concerns making good profits. The money they intend to raise by way of mortgage is more than twice covered by the value of the property they will take possession of; and the price of gas is practically at the discretion of the Corporation. Under these circumstances, we hope that when the question comes before the ratepayers, a majority of whom, in Birmingham, are gas consumers, they will firmly resist taxation in disguise, and demand that the surplus profits of the undertaking shall be applied in reduction of the price of gas.

The Corporation of Southport, it appears to us, have made out a very good case for an advance of price, and we have no doubt they will get it. They have been opposed by the Local Board of Birkdale, whom they supply with gas, on somewhat peculiar grounds; but as the absorption of gas undertakings by corporations increases, we are very likely to hear the same arguments used over again. In Southport, the profits of the undertaking are applied in relief of rates, and the contention of the Local Board of Birkdale practically is, that they are taxed for the benefit of Southport. They evidently think, although they do not exactly say so, that when one local authority supplies another with gas, it should be done at cost price. It seems that an allowance of 8d. per 1000 is actually made to the Birkdale Board, and it is said that 2d. per 1000 feet will cover the interest of the money laid out by the Board on mains, &c., so that the Board do obtain a profit of 6d. per 1000. But the Board have taken it into their heads that the Corporation of Southport have been making "enormous profits," and that Birkdale has not had a fair proportion. We may hear presently what the borough of Walsall, which will soon be supplied by the Corporation of Birmingham, will say on this question. Will Walsall consent to be taxed for improvements and the relief of rates in Birmingham?

The report and statement of accounts of the Alliance and Dublin Gas Company, to be submitted to the half-yearly meeting on the 31st inst., have been published, and from them we learn that the operations of the company during the past half year have been carried on at a loss of £9464 12s. 1d.! As the directors say, no better result was to be expected. We gather from the report that the Confiscation Bill of the Corporation will be stoutly opposed; and, if the opposition be sincere, we have no doubt it will be successful. The general public in Dublin exhibit almost complete apathy on the gas question. The Chamber of Commerce, it is said, will not interfere; but a self-appointed committee of citizens have decided on petitioning against both Bills. A portion of the press, without, it seems to us, giving due consideration to the matter, while urging the incompetence of the Corporation, abuse the company for wishing to reduce the illuminating power of the gas, yet still retaining the present maximum price. We have before pointed out that the 5s. 6d. asked by the company is a *maximum* price which the Dublin consumer may be assured will not be maintained when the company have secured a reasonable profit. We do not for a moment suppose that the directors will endeavour at once to realize a maximum profit. They will work gradually up to it, reducing the price of gas so soon as they have recouped themselves for past losses. As regards the proposed change of quality in the gas, we do not believe that any consumer who does not possess a photometer (a writer in *Saunders's News Letter* seems to suppose that a good many do) will ever discover the difference between 16 and 20 candle gas; and if the gratuitous supply of burners proposed by the company be intelligently superintended, the consumers may be even better satisfied with the lower quality. It is the burner that makes the light; and, while on this subject, and since a good deal has been written in Dublin about Scotch gas, which is thought cheap on account of its high illuminating power, let us quote the opinion of a very able authority, Mr. Key, of Dumbarton, who, addressing a meeting of the West of Scotland Association of Gas Managers, last week, said: "It would, he believed, be found an indisputable fact that, were it possible to apply the proper test to 100 average consumers lights, in any town of Scotland, supplying 28-candle gas, he would guarantee that 70 out of every 100 would be found giving a light of less than eight candles, with which the consumers seemed quite pleased." He adds further that, "When across the border lately, he was struck with the brilliancy of their lights compared with those of our own dwellings, and, on inquiry, he found the gas to be 14 to 18 candles."

As intimated above, the West of Scotland Association have just held their quarterly meeting at Hamilton. Interesting papers were there read, "On an Improved Method of Carbonizing Coal, "with Comparative Statistics," by Mr. Abraham Malam; "On a "Simple Method of Repairing Small Holes in Gasholders," by Mr. John Hall; and "On a Patented Oven and Retorts for "Distilling Coal and Shale, with Diagrams," by Mr. John Patison. The next meeting of the Association will be held in Dumfries. Of the papers, and of Mr. Key's valuable opening address, we shall soon be able to furnish a full report. In the meantime, it is only necessary to say that the meeting, at which there was a full attendance, passed off very pleasantly and profitably.

We have had occasion to mention a few small reductions in the price of gas, but an extraordinary fall has been brought to our notice. The lessee of the New Gas-Works, Whitehaven, advertises that from and after to-day the price of gas to private consumers will be 10d. per 1000 feet (!!) Until to-day the price has been 4s. 7d. per 1000 feet. Whitehaven has the advantage of being supplied by two competing undertakings, and now, we presume, a contest has been commenced to decide which shall be first ruined.

WATER AND SANITARY NOTES.

The Town Council of Exeter have applied to the water-works company, under the provisions of the Public Health Act, 1848, for a continuous daily supply of water. The company do not in terms refuse the supply, but they point out to the council that the adoption of the system of a constant supply would involve an almost entire reconstruction of the existing service fittings throughout the city, and a continuous supervision of details, which must prove annoying to the consumers; and they go on to express a hope that, seeing the present supply is not alleged to be defective in quantity or quality, the council will earnestly consider whether they are justified in involving the city and company in the serious cost of the alterations. Of course, this reply is considered "eminently unsatisfactory," and there is a talk of sending a deputation to the proper authority, in order to get a Bill brought in to extend the provisions of the Metropolis Water Act to the whole of the kingdom. To this, we believe, no water company will object; but, if the Act be obtained, we believe the Town Council of Exeter, like the London local authorities, would hesitate to put it in force.

The Water Bill of the Corporation of Nottingham will be strongly opposed by the surrounding townships and parishes, unless satisfactory terms for the supply of these places can be arranged. Last year the Corporation opposed the company in their endeavour to give a supply to these outlying districts, some of which stand greatly in need of good water. The inhabitants, however, have a wholesome dread of being taxed for the benefit of Nottingham, in the shape of gas and water rates, and seem determined to know, before they are quite at the mercy of the Corporation, the terms on which it is proposed to supply them. We do not wonder at this determination, for, once in the hands of the Corporation, the neighbouring parishes would have no remedy against high rates.

Chester is to witness the excitement of a poll under the Municipal Corporations (Borough Funds) Act. Our readers know that the water-works company are promoting a Bill, which the Corporation seek power to oppose. In the meantime, a committee of the Town Council have decided to recommend the purchase of the water undertaking, on terms proposed by the company. Under these circumstances, it does seem hard that the city should be put to the expense of a poll at the instance of one individual, whose motives may be excellent, but whose want of discretion is apparent enough. What the result of the poll, which is to take place on the 17th of next month, may be, so far as we are able to judge, is not doubtful, and this illustration of the working of the Act is sure to be laid hold of by those who are seeking to get it repealed. If the company had not offered to sell, the action of our friend would have been quite legitimate; but, under existing circumstances, it looks vexatious.

The management of the Oxford Water-Works is to be transferred from a small body of trustees to the Corporation of the city, and it is intended to make considerable extensions to the works. A constant supply is also under consideration. The Lords of the Treasury have authorized the Corporation to raise £30,000, to be applied in satisfaction of debentures and existing mortgages, and for carrying out the works and extensions necessary. One of these extensions is the driving of a main to Bullingdon, for the supply of the military depôt to be formed there.

The Local Board of Leamington have decided, by a majority of one, on accepting a tender for the sinking of an artesian well, on land they have not yet acquired, but which, it is fair to add, they may have no difficulty in getting. The specification was for a shaft 50 feet deep, and a bore-hole 150 feet further. The tender accepted was for £575, another offering to do the work for £5000. There is still a doubt in the minds of some members of

the Board that water will not be found at the depth indicated. It is stated, however, that at a brewery not far distant, water is found at a depth of 180 feet, so that if the Board find water, and pump 500,000 or 1,000,000 gallons a day, the brewery well will probably be dry. No fear seems now to be entertained that the proposed boring will reach the mineral waters.

It seems clear to us that a Public Health Act, like that of 1872, can never be made to work, until the country is mapped out into sanitary "unions," upon definite principles, based on the physical geography of the respective areas. Here is an illustration. Canton is a suburb of Cardiff, but has a separate sanitary authority, who are anxious to drain their district, but cannot easily find an outlet. "Here," says Major Tulloch, at a Local Government Board inquiry, "is Canton, hemmed in on every side by various "sanitary authorities, and it cannot move without obstructions "being thrown in its way. What is to be done? If one "Local Board were formed for all the land lying between the "Ely and the Taff, it would make a capital district, and there "would be some hope of a proper system of drainage being car-"ried out. At present Canton cannot move out of its district "without going into the district of some neighbour or other, who "immediately throws out an objection." The jealousy of Local Boards, however, stands in the way of voluntary amalgamation, and we fear that little satisfactory progress will be made until sanitary "unions" are compulsorily formed, as poor-law unions were after 1834.

MARGATE DRAINAGE COMPETITION.

A few months ago the Corporation of Margate—a well-known sea-side resort of Londoners—invited tenders for draining the borough, and for the disposal of its sewage. The result has been that seven tenders have been sent in, and by the courtesy of Mr. P. B. Coghlan, C.E., we are in possession of a summary of all the proposals that have been made. These tenders present some very remarkable features, but especially in respect to their variety of estimate of cost in carrying out the proposed sanitary arrangements. They by no means encourage Corporations or Local Boards of Health in entering on extensive plans.

Taking the tenders in the order they appear in Mr. Coghlan's report, the first that meets our notice is that of "Eco-"nomy," who proposes to unite the drainage of the two valleys by a tunnel sewer. The entire system that he suggests, without our entering on minute details, concludes in sending the sewage into the sea through an outfall terminating by iron pipes on the beach at Botany Bay. This is the only scheme which dispenses with pumping, and avoids an annual outlay. "C. E." proposes to separate the rainfall from the sewage, and take the former direct into the harbour. He requires a pumping-station to draw the whole of the sewage to the summit at Northdown, whence it would flow into the sea by gravitation at the same spot as that selected by "Economy." The total estimated cost of the works would be £31,800, besides land, compensation, &c., which would give an additional £2200, making a total of £34,000. The annual expenses of pumping, &c., are estimated at £600, which, capitalized at 5 per cent., would make an addition of some £12,000, or £46,000 in all. "Intermittent Filtration" proposes to take the whole of the sewage of the town to a pumping-station on the west side of the London, Chatham, and Dover Railway, and thence to pump it to a height of 90 feet at a point near the railway bridge at the top of St. Peter's road. Thence the sewage is to be directed, by means of earthenware pipes, to an area of some 20 acres of land, where it is to be disposed of on the principle of Intermittent Downward Filtration. The cost for sewers, engines, &c., is estimated at £39,345, exclusive of land, with an annual cost of £620, which capitalized, and with land, would make a total of about £54,000. "Experientia" proposes to take the sewage to a pumping-station near the London, Chatham, and Dover Station. He recommends the sewage to be subsequently disposed of by irrigation on between 300 and 500 acres of land. His scheme would involve an expenditure of about £50,000 (without purchasing land) at an estimated annual cost for pumping of £1526, or say capitalized, in all, at about £80,000, besides land.

"Experience" suggests a plan of pumping and subsequent irrigation, which would involve a first cost, exclusive of the purchase of land, of about £26,000, with an annual expenditure of about £500. "Westminster" suggests a combined plan of pumping and irrigation, at a first cost of £22,420, with an estimated annual outlay of £1110. "Carefully Considered" suggests a similar plan, at a first cost of £16,300, with an annual expense of £507 for pumping, &c. He only requires some 45 acres of land, while others we have mentioned, require something like 500 acres for irrigation purposes. This is certainly a remarkable difference, and shows that either engineers, chemists, or some one must be at fault in their estimate. Last in the list is "Ex Luto Lucellum," whose plan is that of sewering the whole town with earthenware glazed pipes, with the exception of a short length of oval brick sewer. The sewage is to be pumped to a well at the back of the Kent Hotel, where it is to be treated by the A. B. C. process. The resulting effluent water is conveyed thence into the sea, and the manure, precipitated as Native Guano, will, it is expected, by its sale, more than cover the annual cost of the works. The estimated cost of the whole sewering in the borough, including outfall to the sea, is £16,000, and the cost of engines, plant, &c., is £8070. The *weekly* cost would be about £130, or say, £7000 annually, producing weekly an amount of 50 tons of Native Guano, which is stated to sell at £3 10s. per ton. According to a report furnished by Alderman Tatham, of Leeds, the effluent there of the A. B. C. process is excellent, and the reports of the Corporation, through their Sewage Committee, give a value of the Native Guano equivalent to that of Peruvian guano of the best quality, the price of the two respectively being £3 10s. and £13 per ton. In regard to the amount of the relative produce of grass, it appears that the Native Guano gives the best financial results at the same cost.

The authorities of Margate have a most difficult task to perform. Estimates, varying from £20,000 to £80,000 expenditure, are somewhat serious to decide on. In our opinion, founded on a knowledge of Margate of nearly 40 years, we should have much difficulty in deciding on the best course. In any case, the effluent, or sewage, should be taken into the sea below—that is, westwards of what, in our younger days, was called "Buenos "Ayres," or rather westwards of the Sea Bathing Infirmary.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

VII.

Historical Introduction.

(Continued.)

The business of the Chartered Company continuing to increase, they made a fourth application to Parliament in 1823, for powers to extend their capital by a further sum of £300,000, making a total of £900,000, and this capital remained without alteration until the year 1867, a circumstance which conveys the impression that, during the interval, energy was not amongst the characteristics of the directors of the company.

In 1823 the Ratcliff Company was incorporated by Act of Parliament, with a capital of £100,000; and, in the same year, John Malam patented his beautiful arrangement of dry-lime purifiers, hereafter referred to.

The introduction of oil gas into many of the cities and towns of the realm, with the fallacious report of their success, were conducive to the formation of a metropolitan company for a like purpose; and early in the year 1824, application was made to Parliament for an Act of incorporation for the "London and Westminster Oil Gas Company," empowering them to raise a capital of £500,000, to manufacture and supply oil gas in the cities of London and Westminster. According to the usual practice, a select committee was appointed to investigate the merits of the proposed bill, as also the grounds of the different petitions presented against it. The commencement of these proceedings was in May, and such was the extensive nature of the inquiry, that they lasted throughout the whole of the session of 1824, and part of that of the year following.

Amongst the supporters of oil gas were some of the most eminent scientific men of the day—Sir Humphrey Davy, Michael Faraday, Richard Phillips, editor of the "Annals of Philosophy," T. W. Brande, lecturer on chemistry, Sir William Congreve, the Government inspector of gas-works, &c., who all gave evidence on this occasion more or less favourable to oil gas, with a view to demonstrating its superiority to that produced from coal.

The principal advantages were represented as follows:—

The illuminating power of oil gas, as compared with coal gas, is as from three or four (according to the various witnesses) to one—or, in other words, oil gas yields three or four times the light of coal gas.

The light yielded by oil gas being so much greater than coal gas, the quantity required will be reduced in the same proportion; and, in consequence, the manufacturing apparatus, mains, pipes of distribution, and capital, would in like manner be diminished.

The operation of manufacture is more simple, cleanly, and healthy for the workmen employed.

The gas can be procured from oil unsuitable for burning in lamps, therefore possessing little value.

The heat evolved from oil gas, for the light obtained, is less than that from coal.

Oil gas is entirely free from the impurities—sulphuretted hydrogen, ammonia, and carbonic acid—which exist in coal gas; and, on "these accounts, oil gas only is suitable to be used in private houses and places of public resort."

Coal gas was also asserted to be more susceptible to explosion than the other, and, according to Sir William Congreve, "the most important feature in the use of oil gas is its safety, as, from the very narrow limits of the explosive mixture that can be formed of this gas and atmospheric air, it is scarcely possible that an accident can arise." The witness evidently imagined that the explosive compound was formed by the hydrogen only of the gas intermixing

with atmospheric air—an error corrrected by the witnesses produced in favour of coal gas.

To demonstrate the danger of coal gas, the Peter Street accident, and an explosion of a gasholder which took place at Manchester in 1819, with other minor accidents, were brought very conspicuously before the committee; and, to show the impurities of coal gas, samples of corroded copper pipes, and metal goods that had been tarnished by the action of impure gas, were exhibited.

Against this formidable array of witnesses for the promoters, the coal gas companies had to contend, and the Chartered Company, being the oldest and most extensive, was the first that engaged the attention of the committee in reply. The petition presented by that company was admirably worded, and stated plainly the petitioners reasons for opposing the measure proposed. I gave a concise yet comprehensive view of the rise and progress of that company, of the prejudices and difficulties they had surmounted, of the sacrifices they had made, and the hazard and expenses they had incurred in the course of their operations, from all of which the public had derived great advantages in many respects, and, from their experience, all other gas companies had profited.

The investigation was of vital importance to the metropolitan coal gas companies, for on the result depended the value of the large capitals invested in that industry. Truth and justice were on their side, therefore it was necessary the evidence should be clear, precise, and minute, so as to render it satisfactory to the committee, and carry conviction with it.

The scientific witnesses on behalf of the coal gas companies were Mr. Herepath, of Bristol; Mr. Dalton, Mr. J. T. Cooper, Professor Leslie, Dr. Fyffe, and Mr. Anderson, of Perth, all well-known chemists; and Mr. George Lowe, engineer of the Chartered Company.

The testimony of these gentlemen varied widely from that of the witnesses engaged on the other side. Mr. Herepath deposed that the light of oil gas, as compared with that from coal, was as $2\frac{1}{10}$ to 1; that coal gas could be purified so as to leave no smell when burning; and he suggested the means of removing the ammonia by washing the gas in dilute sulphuric acid.

Mr. Dalton, president of the Philosophical Society of Manchester, gave evidence to the effect that coal gas could be rendered free from sulphuretted hydrogen, carbonic acid, and ammonia, by the ordinary process of purification; that oil gas was alike in nature to that obtained from coal, but contained more olefiant gas; that inasmuch as coke was used in the retorts in the manufacture of oil gas, both carbonic acid and sulphuretted hydrogen might be produced; and that the oil gas apparatus not having the means of removing these impurities, they could exist in that gas. Referring to the explosive qualities of the two gases, he stated that an explosive compound was formed with one part of oil gas to eighteen or twenty of atmospheric air, or with one of coal gas to eight or ten of air; thus proving the former to be the more explosive and dangerous. The illuminating power of the gases he considered to be as two to one. The difference in the evidence of this gentleman and Mr. Herepath on this point was undoubtedly due to the nature of the coal from which they derived their gas.

With the view of giving evidence on this important occasion, Professor Leslie, Dr. Fyffe, and Mr. J. T. Cooper had made collectively some extensive experiments on the production of the two gases and their varied properties, and consequently they were enabled to speak with all confidence. By them the evidence of Mr. Dalton was confirmed in its various points, proving that coal gas could be easily deprived of the impurities combined with it; that the light of oil gas was about double that of coal gas; and that oil gas was more explosive and dangerous than the other.

Various other witnesses were examined on practical points. One of them, a chemist before mentioned, Mr. Adam Anderson, of Perth, stated that in 1822, when it was determined to light the city of Perth with gas, he had been requested to obtain information, in order to decide whether oil or coal gas was the more desirable to adopt. For this purpose he visited several works for the manufacture of both kinds of gas; but the information he obtained was so conflicting and unsatisfactory that he resolved to make a small apparatus, at a cost of about £100, capable of producing the two kinds of gas, and to judge for himself. With this apparatus he experimented for three months, and in the end was induced to adopt the use of coal for the production of gas. He stated that at the period of his giving evidence, coal gas was in use at Perth, and that taking the testimony of Taylor and Martineau, *oil gas was four times more costly than coal gas;* and he estimated the illuminating power of the two gases to be as 100 is to $80\frac{1}{2}$. We may conclude that Mr. Anderson employed a good "parrot" or cannel coal to obtain gas of such a superior quality, and as all the other witnesses on both sides referred to that which was obtained from Newcastle coal, the discrepancy is explained.

But the most important witness on behalf of the coal gas companies was Mr. George Lowe, who was engineer of the Chartered Company, and whose examination extended over several days. That gentleman was a native of Derby, and had been entrusted, about six years prior to this investigation, with erecting and putting in operation the gas-works for supplying that town; and, subsequently, when oil gas was brought before the public, he entered into investigations on purpose to arrive at the truth, with the view of adopting the gas which offered the greatest advantages; and by these investigations he was convinced that oil gas could not be employed as a commercial enterprise in competition with coal gas. These opinions he had published through the *Philosophical Magazine*, the *Quarterly Journal*, and other periodicals. From his researches, therefore, he was well qualified to give evidence on this important occasion.

In his evidence, Mr. Lowe, in addition to the confirmation of preceding witnesses in support of coal gas, proved that the cost of the first material (at 3s. per gallon), to produce 1000 feet of oil gas, would be upwards of 30s; that, by the apparatus then in use at the Chartered works, the coal gas could be, and was, purified so as to deprive it of all the obnoxious qualities mentioned by the witnesses favourable to oil gas; and, such was the surety of the operation, that if the man in charge neglected his duty for 24 hours together, the gas would still be delivered in a pure state. He further stated that, to supply a public lamp with oil gas, admitting its illuminating power to be double that of coal gas, it would require $2\frac{1}{2}$ feet per hour; and taking an average of 4000 hours, or 10,000 cubic feet per annum (according to price charged for oil gas, 50s. per 1000 feet), it would amount to £20; whereas gas companies only received £5 or £5 5s. for this lighting, which included all expenses. Hence it was obvious that, under any circumstances, the supply to the public lamps would be ruinous to any oil gas company in the world.

In illustration of the explosive powers of the respective gases, he had prepared models, so that experiments were made in the presence of the committee, which naturally produced more effect than simple assertions. The evidence of Messrs. Anderson and Lowe on the relative cost of oil and coal gas, which had been studiously avoided by their opponents, was of the most vital importance, and as the company were determined to be prepared on all points, Mr. John Evans, engineer at the Peter Street station, was called, and he deposed that, if necessary, the whole of the works belonging to them could be converted and made suitable for the manufacture of oil gas, for the sum of £30,000.

The result of the inquiry was that the powerful evidence brought by the coal gas companies, in the defence of their interests, completely defeated the scheme of the London and Westminster Oil Gas Company, but their victory involved them in very large expenditure.

During the period of this parliamentary inquiry, some oil gas companies had given up the use of oil, and adopted coal for the manufacture of gas, and witnesses gave evidence to that effect. The Edinburgh Oil Gas Company applied to Parliament in 1827 for certain powers to enable them to convert their works into coal gas-works; and in the inquiry on that occasion, it was given in evidence that the average produce from a gallon of oil was 75 cubic feet, but that they only received payment for 55 feet. It was stated that their operations, during a period of five years, were attended with a loss approaching £60,000.

(To be continued)

Correspondence.

THE TRUE PRINCIPLE OF THE VALUATION OF GAS COAL.

SIR,—On re-reading my article, which you published on the 17th inst., on the valuation of coal, I find that two errors have occurred in the column where the return per ton has been multiplied by the excess or deficiency of the value in candles per 1000.

The change in value is not a very material one, and does not affect the principles discussed. But I should feel obliged, if, instead of inserting errata, you would be so kind as to reprint the portion of the article I have referred to, with the corrections I have indicated.

Stalybridge, March 25, 1874. D. A. GRAHAM.

[In accordance with the request of our correspondent, we here reprint the tables with his corrections.—ED. J. G. L.]

COAL PRODUCING 8000 CUBIC FEET PER TON.

	Receipts.		Expenditure.	
1·25 ton of coal, producing 8000 cubic feet per ton = 10,000 cubic feet, at 3s. 3d. per 1000	£1 12 6	....	—	
One-third of the weight carbonized sold as coke, at 10s. per ton	0 3 4	....	—	
One-third of the weight carbonized used as fuel in the settings, at 10s. per ton	—	....	£0 3 4	
Tar sold, at 4s. 4d. per 10,000 cubic feet manufactured	0 4 4	....	—	
Wages, at 2s. 5d. per ton on $1\frac{1}{4}$ ton	—	....	0 3	$0\frac{1}{4}$
Interest on settings, at 1s. per ton on $1\frac{1}{4}$ ton	—	....	0 1	3
Repairs and renewals, at 1s. per ton on $1\frac{1}{4}$ ton.	—	....	0 1	3
	£2 0 2		£0 8	$10\frac{1}{4}$
	0 8 $10\frac{1}{4}$			
Excess of receipts over expenditure	£1 11	$3\frac{3}{4}$		

Receipts and Expenditure reduced from $1\frac{1}{4}$ *Ton to* 1 *Ton.*

Receipts	£1 12	$1\frac{1}{2}$
Expenditure	0 7	1
Excess of receipts over expenditure	£1 5	$0\frac{1}{2}$

COAL PRODUCING 8500 CUBIC FEET PER TON.

	Receipts.		Expenditure.	
1·176 ton of coal, producing 8500 cubic feet per ton = 10,000 cubic feet, at 3s. 3d. per 1000	£1 12 6	....	—	
One-third of the weight carbonized, at 10s. per ton, sold as coke, against one-third of the weight carbonized used as fuel, at 10s., makes values of receipts and expenditure in this article equal, and may be left out of both receipts and expenditure	—	....	—	
Tar sold, at 4s. 4d. per 10,000 cubic feet made.	0 4 4	....	—	
Wages, at 2s. 5d. per ton on 1·176 ton	—	....	£0 2	10
Interest on settings, at 1s. per ton on 1·176 ton	—	....	0 1	2
Repairs and renewals, at 1s. per ton on 1·176 ton.	—	....	0 1	2
	£1 16 10		£0 5	2
	0 5 2			
Excess of receipts over expenditure	£1 11	8		

Receipts and Expenditure reduced from 1·176 *Ton to* 1 *Ton.*

Receipts	£1 11 3
Expenditure	0 4 4¾
Excess of receipts over expenditure	£1 6 10¼

COAL PRODUCING 9000 CUBIC FEET PER TON.

	Receipts.	Expenditure.
1·111 ton of coal, producing 9000 cubic feet per ton = 10,000 cubic feet, at 3s. 3d. per 1000	£1 12 6	—
Receipts and expenditure for coke equal, and not added to either column	—	—
Tar sold, at 4s. 4d. per 10,000 cubic feet made	0 4 4	—
Stokers wages, at 2s. 5d. per ton on 1·111 ton	—	£0 2 8¼
Interest on settings, at 1s. per ton on 1·111 ton	—	0 1 1½
Renewals, at 1s. per ton on 1·111 ton	—	0 1 1½
	£1 16 10	£0 4 11¼
	0 4 11¼	
Excess of receipts over expenditure	£1 11 10¾	

Receipts and Expenditure reduced from 1·111 *Ton to* 1 *Ton.*

Receipts	£1 13 1¾
Expenditure	0 4 5½
Excess of receipts over expenditure	£1 8 8¼

COAL PRODUCING 9500 CUBIC FEET PER TON.

	Receipts.	Expenditure.
1·052 ton of coal, producing 9500 cubic feet per ton = 10,000 cubic feet, at 3s. 3d. per 1000	£1 12 6	—
Receipts and expenditure for coke equal	—	—
Tar sold, at 4s. 4d. per 10,000 cubic feet made	0 4 4	—
Stokers wages, at 2s. 5d. per ton on 1·052 ton	—	£0 2 6½
Interest on settings, at 1s. per ton on 1·052 ton	—	0 1 0½
Renewals of settings, at 1s. per ton on 1·052 ton	—	0 1 0½
	£1 16 10	£0 4 7½
	0 4 7½	
Excess of receipts over expenditure	£1 12 2½	

Receipts and Expenditure reduced from 1·052 *Ton to* 1 *Ton.*

Receipts	£1 15 0
Expenditure	0 4 4¾
Excess of receipts over expenditure	£1 10 7¼

COAL PRODUCING 10,000 CUBIC FEET PER TON.

	Receipts.	Expenditure
One ton of coal, producing 10,000 cubic feet per ton = 10,000 cubic feet, at 3s. 3d. per 1000	£1 12 6	—
Receipts and expenditure for coke equal, and not added to either column	—	—
Tar sold, at 4s. 4d. per 10,000 cubic feet made	0 4 4	—
Stokers wages, at 2s. 5d. per ton	—	£0 2 5
Interest on settings, at 1s. per ton	—	0 1 0
Repairs and renewals, at 1s. per ton	—	0 1 0
	£1 16 10	£0 4 5
	0 4 5	
Excess of receipts over expenditure	£1 12 5	

COAL PRODUCING 10,500 CUBIC FEET PER TON.

	Receipts.	Expenditure.
0·952 ton of coal, producing 10,500 cubic feet per ton = 10,000 cubic feet, at 3s. 3d. per 1000	£1 12 6	—
Receipts and expenditure for coke and fuel equal, and not added to either column	—	—
Tar sold, at 4s. 4d. per 10,000 cubic feet made	0 4 4	—
Stokers wages, at 2s. 5d. per ton on 0·952 ton	—	£0 2 3½
Interest on settings, at 1s. per ton on 0·952 ton	—	0 0 11½
Repairs and renewals, at 1s. per ton on 0·952 ton	—	0 0 11½
	£1 16 10	£0 4 2½
	0 4 2½	
Excess of receipts over expenditure	£1 12 7½	

Receipts and Expenditure increased from 0·952 *of a Ton to* 1 *Ton.*

Receipts	£1 18 8
Expenditure	0 4 5
Excess of receipts over expenditure	£1 14 3

COAL PRODUCING 11,000 CUBIC FEET PER TON.

	Receipts.	Expenditure.
0·909 ton of coal, producing 11,000 cubic feet per ton = 10,000 cubic feet, at 3s. 3d. per 1000	£1 12 6	—
Receipts and expenditure for coke and fuel equal, and not added to either column	—	—
Tar sold, at 4s. 4d. per 10,000 cubic feet made	0 4 4	—
Stokers wages, at 2s. 5d. per ton on 0·909 ton	—	£0 2 2¼
Interest on settings, at 1s. per ton on 0·909 ton	—	0 0 11
Repairs and renewals, at 1s. per ton on 0·909 ton	—	0 0 11
	£1 16 10	£0 4 0¼
	0 4 0¼	
Excess of receipts over expenditure	£1 12 9¾	

Receipts and Expenditure increased from 0·909 *of a Ton to* 1 *Ton.*

Receipts	£2 0 6
Expenditure	0 4 5
Excess of receipts over expenditure	£1 16 1

From these results it appears that the receipts from a ton of the various qualities of coal producing from 8000 to 11,000 cubic feet, and supposed, in the first instance, to produce gas of equal illuminating power, possess the following relative values:—

Cubic Feet.		A Difference of
8,000	£1 5 0½	—
8,500	1 6 10¼	1s. 9¾d.
9,000	1 8 8¼	1 10¼
9,500	1 10 7¾	1 11
10,000	1 12 5	1 9¾
10,500	1 14 3	1 10
11,000	1 16 1	1 10

From this table it appears that if the coals possess equal illuminating power when subjected to the same heats in being carbonized, and the one produces 1000 cubic feet less than the other, it is worth 3s. 8d. less, and so on proportionally for each 1000 less or more produced.

The several columns in the following table are compiled in the following manner:—The standard coal is assumed to produce 10,000 cubic feet of 14-candle gas, and by multiplying any of the returns per ton in the first column by the illuminating power of the coal producing 10,000 cubic feet, and dividing by the first number referred to, the quotient will give the proportional return per ton for that return per ton. Thus—

$$\frac{11{,}000 \times 14}{10{,}000} = 15{\cdot}4 \text{ candles.}$$

The third column shows the proportional increase or decrease in the illuminating power in candles above or below the standard here assumed, 10,000 cubic feet of 14-candle gas. The fourth column, the value of a candle, 1½d. per 1000 for each 1000. The fifth column, the value of the excess or deficiency of illuminating power of the gas multiplied by the 1½d. per 1000, showing the deficiency or excess of value per 1000. The sixth column, the return per ton multiplied by the value of the fifth column.

Gas Made per Ton. Cubic Feet.	Proportional Illuminating Power. Candles.	Increase or Decrease in Illuminatg. Power. Candles.	Value of a Cand. at 1½d. p.1000.	Value of the Excess or Deficiency p. 1000, at 1½d. per 1000.	Return per Ton multiplied by the Value of the Excess or Deficiency of the Value in Candles per 1000.
11,000	15·4	1·4	1½d.	2·1d.	23·1d. = 1s. 11d.
10,500	14·7	0·7	1½	1·05	11·025 = 0 11
10,000	14·0	0·0	1½	0·0	00·0 = —
9,500	13·3	0·7	1½	1·05	9·975 = 0 10
9,000	12·6	1·4	1½	2·1	18·9 = 1 7
8,500	11·9	2·1	1½	3·15	26·775 = 2 2¾
8,000	11·2	2·8	1½	4·2	33·6 = 2 9½

From this table it appears that if the standard coal be assumed to produce 10,000 cubic feet per ton of 14-candle gas, and the production per ton be proportional to the returns per ton, then the following table, with prices of coal and cannel as before quoted, would show the relative values of different coals compared with that standard:—

Cubic Feet.	Values Correponding to Return per Ton, at 1s. 10d. per 500 or 3s. 8d. per 1000 Cu. Ft.	Values Corresponding to Proportional Illuminating Power.	Both Values added.
	s. d.	s. d.	s. d.
11,000	3 8	1 11	5 7
10,500	1 10	0 11	2 9
10,000	—	—	—
9,500	1 10	0 10	2 8
9,000	3 8	1 7	5 3
8,500	5 6	2 2¾	7 8¾
8,000	7 4	2 9½	10 1½

The last column shows the difference in value for each increase or decrease per 500 per ton, *plus* the corresponding proportional increase or decrease in the illuminating power of the gas; and the following table shows how these values compare with the 10,000 per ton of 14-candle gas, taken as the unit of comparison:—

Candles.				
15·4	11,000	cubic feet is worth	5s. 7d.	more
14·7	10,500	" "	2 9	more
14·0	10,000		—	
13·3	9,500	" "	2 8	less
12·6	9,000	" "	5 3	less
11·9	8,500	" "	7 8¾	less
11·2	8,000	" "	10 1½	less

Than a coal producing 10,000 cubic feet of 14-candle gas, coal at £1; cannel of 22-candle gas, 10,000 to the ton, at 30s.

And, on these assumptions, a coal producing 11,000 cubic feet per ton is worth 15s. 8½d. more than a coal producing 8000 cubic feet per ton; a coal producing 10,500 is worth 8s. more than one producing 9000 cubic feet of 12·6 candle gas, and 10s. 5¾d. more than a coal producing 8500 cubic feet.

"LONDON" ARGANDS *v.* SILBER BURNERS.

SIR,—Will you kindly permit me to make some observations relative to two paragraphs which appeared in the last issue of your JOURNAL, dated the 24th inst., in order to correct an impression which has doubtlessly been produced on the minds of many of your readers, through their appearance together in the same number?

You say, in the last paragraph of your "Circular to Gas Companies," that the gas world will be surprised to hear that Mr. Silber has invented a burner which gives for the same quantity of gas consumed 20 per cent. more light than the "London" burner.

As far as I can learn, the gas world is surprised, and I share with them the same sensation. So far, so good; but a little further on in the JOURNAL, at page 396, there appears a condensed report of the meeting of the Silber Light Company, in which one reads that, after the usual congratulatory remarks uttered by a gentleman in his position, under such agreeable circumstances as those described in the paragraph, the chairman said that Mr. Silber had not contented himself with making improvements in lamps, but had extended them to gas lighting. He then speaks of a burner invented by Mr. Silber, which, according to quotations made from a report from the South Kensington College of Chemistry, would appear to give, with 4 feet of gas, as much light as could be obtained from 5 feet with the ordinary burner; and, further, that the ordinary gas with the improved burner gave as much light as the cannel coal gas with the ordinary burner, saving from 20 to 25 per cent. He believed the saving now amounted to about 50 per cent. of gas.

Now, sir, I think that, however satisfactory and pleasant this might be to the ears of a fond proprietary, who had just been informed that they were to divide 10 per cent. dividend, and who were naturally not disposed to be too critical, it might very well have been left without a remark from me but for your own paragraph. To all who read the report of the proceedings of the Silber Light Company, and your remarks upon Mr. Silber's burner, a meaning will naturally be given to the statement made by the chairman, which I do not think he meant to convey.

He speaks of a burner which saves from 20 to 25 per cent. of gas, invented by Mr. Silber. You speak also of the same burner, which gives, according to Mr. Valentin (who is, as a very great many of those who constitute the gas world know, one of the principal officers of the South Kensington College of Chemistry), 20 per cent. more light than the "London" Argand burner.

Naturally, the burner mentioned as the ordinary burner by Sir John Hay is supposed to be the "London" Argand. Now, I do not think he meant anything of the sort, neither do I believe he meant to say that the saving of gas by the new Silber burner amounted now to about 50 per cent. of gas. Yet, nevertheless, some of the gas world have been *surprised* to that extent. They have seen looming in the future the dividends of the Silber Light Company going up, and those of the gas companies coming down, until, by successive improvements of Sugg upon Silber and Silber upon Sugg, there is no saying how many per cent. of gas and gas managers will be entirely dispensed with.

Will you permit me to say to the surprised gas world, that if they will only defer their judgment upon the respective merits of the Silber *burner*, and the "London" *burners*, until a proper examination of them can be made, and the question of the evolution of light and the suppression of gas scientifically determined, it will be a much safer course to pursue than in a moment of dazzled bewilderment to agree to the imposition of an increase of illuminating power without a corresponding increase of price, in any bills which come before Parliament this session. The assumption that say, 14-candle gas can be improved into 17-candle gas by passing it through a Silber burner may be unfounded, and this cure for the high price of cannel may be visionary.

I know very little of the Silber burner at present, but I think it is generally conceded that I do know something of gas-burners in general, and I venture to say, from the deep study I have given to this subject for many years past, that when a trial of this burner is properly made, it will *not* be found that upon all the points which together constitute a good burner, the Silber *burner* is equal to the "London" *burners*.

And now permit me to inform you, sir, and the gas world generally, that the "London" Argand burners are, up to this moment, eight in number, and are distinguished by letters, A being the smallest size and H the largest. Each letter which marks the size comprises different sorts of burners for different purposes, and are made with governors to regulate the height of the flame, or, not having those, with the well-known regulating screw which I first introduced. There are also "London" flat-flame burners, with governors attached to them, of several different sorts and sizes.

The Argands consume, with excellent results, all kinds of gas, of various illuminating powers, from 12 to 30 or 40 candles.

They give for the quantity of gas consumed a *pro ratâ* amount of light —*i. e.*, when it is consumed through the burner proper for that quantity.

Those principally known to the gas world as testing burners are Nos. D and C., or No. 1 and No. 0, as described by the referees. The D is used for testing gases ranging from 14 to 18 candles, and the C for 16-candle gas. The D burner is that which I now propose as the standard for measuring the illuminating power of cannel gas equal to 32 candles.

With this gas it will burn 2½ cubic feet per hour, instead of 5 cubic feet as with the gas supplied to the City of London, &c. The light given in both cases is 16 candles.

The appearance of the flame in both cases is very similar, but the cannel gas flame is a little shorter than that with common gas. I think it would not be easy to tell which is cannel and which is common.

I may remark that this burner, as arranged for use according to the instructions of the gas referees, is peculiarly subject to be attacked for the results it gives; and, when compared with other burners, often leads to misleading statements. I have constantly pointed out that it is unscientific to test different qualities of gas with a fixed consumption of 5 cubic feet by the same burner.

Each of these "London" burners gives its maximum result with a certain *quantity* of gas, varying, as in the case of the D burner above mentioned, with the *quality* of the gas.

Intensity of light is not sacrificed to volume, nor the reverse, but a proper proportion of each is given.

It would be manifestly incorrect to compare a C burner with a D burner, each consuming the same quantity of the same gas, although by a very simple arrangement of the current of air passing up its chimney, such as holding a piece of metal over the top, the volume of light given by a C burner for a lesser quantity of gas, may be made to exceed that given for a greater quantity by the D burner; the difference being produced by the sacrifice of some portion of the intensity of the light in the C burner, or the reversal of this operation in the case of the D burner.

No doubt the statement made by Sir John Hay will carry some weight with it to the general public and do gas companies some little harm, perhaps, in these difficult times, by putting suspicions and illusory ideas into the heads of their opponents; but I do not think it will affect the question of standard burners, unless it moves the gas referees to a thorough examination of the whole question, which I consider a very desirable thing.

I will, if you will allow me, send for your examination a complete set of all the "London" burners.

WILLIAM SUGG.

Vincent Works, Vincent Street, Westminster,
March 27, 1874.

Legal Intelligence.

ROLLS COURT.—THURSDAY, MARCH 26, 1874.
(*Before the* MASTER OF THE ROLLS.)

ENFIELD LOCAL BOARD OF HEALTH *v.* HARRISON.—HARRISON *v.* ENFIELD LOCAL BOARD OF HEALTH.

Mr. SOUTHGATE, Q.C., and Mr. BUSH appeared for the board; Mr. FRY, Q.C., and Mr. H. FAWCETT for Mr. Harrison.

These were suits relating to the disposal of the sewage of the Enfield district. Mr. Harrison, having a farm of 162 acres at Edmonton, which he was minded to convert into a sewage farm, in August, 1868, entered into a contract with the local board to erect a pumping-station and other works on his own land, and maintain the same during the term of 25 years from Jan. 1, 1871, to the satisfaction of the engineer of the board, and to take all the sewage and other matters which should be delivered by the board at a given point, at all times and in all weathers, during the term, and apply the same for the purpose of irrigating and manuring his land; with a stipulation that he should during the term convey away the sewage in such a manner as not to escape into the river Lea, or expose the board to any action for nuisance. The pumping-station and other works were erected, and all went on well for a time; but afterwards differences arose between the parties respecting the quantity as well as the quality of the sewage, Mr. Harrison complaining that the board were supplying him with a worthless mixture of sewage and water in such quantities as to drown his land and exceed the means of disposal at his command. The board insisted by their bill that Mr. Harrison was bound to dispose of everything of a fluid nature that they might deliver at the specified point of delivery, and sought, in effect, specific performance of the contract; while Mr. Harrison, by his bill, attributed the excess of subsoil water to the imperfect construction of the pipe drains laid by the board since the making of the contract, and prayed that the board might be decreed to execute all such works as might be necessary to keep the subsoil water out of the sewers.

The MASTER of the ROLLS said the contract was one of a very peculiar character—one which imposed very heavy obligations on Mr. Harrison, and which had turned out very unluckily for him. The question his honour had to decide was whether it was a contract of which the court could decree specific performance consistently with the authorities on the subject, all of which, he believed, had been brought to his notice. He was asked by the board to make a decree that Mr. Harrison should, during the residue of the term of 25 years, take and dispose of all the sewage of the Enfield district, so as to be a nuisance to nobody. How could the court possibly superintend the performance of such a contract? The court was asked to see to the proper disposal of the sewage, as if the court had the means of doing anything of the kind, or of solving the problem how to dispose of sewage. Mr. Harrison's case was that the board were bound to supply him with sewage of a fertilizing character, and he asked for a declaration to that effect; but his honour was of opinion that was not the true construction of the contract, and also thought the difficulties in the way of decreeing specific performance were as insuperable in Mr. Harrison's case as in the case of the local board. It had been argued that Mr. Harrison was entitled to have sewage supplied to him of a quality suitable for his purpose, according to the principle that when goods are sold for an express purpose there is an implied warranty on the part of the seller that the goods are suitable for the purpose; but his honour did not think the principle applied to the present case. Mr. Harrison had agreed to take the sewage, and the board had nothing to do with the process by which he hoped to utilize it. It was exactly as if a man having a project of extracting sunbeams from cucumbers agreed to buy all the cucumbers to be grown in a particular garden, and on finding the project a failure refused to buy any more of the cucumbers. It was clear the court could grant no relief to either party, so both bills must be dismissed, with costs.

MANSION HOUSE POLICE COURT.—MONDAY, MARCH 23.

THE STEAM STOKER COMPANY, LIMITED—PROCEEDINGS AGAINST THE DIRECTORS FOR A BREACH OF THE COMPANIES ACT, 1862.

Mr. *Samuel Andrews*, Mr. *J. Milo Burke*, Mr. *J. Pain*, Mr. *Jabez Church*, Mr. *James Glaisher*, Major *W. Swainson Suart*, and Mr. *Philip Witham* (directors), and Mr. *William Gibson* (secretary and manager), of the Steam Stoker Company, Limited, were summoned by Mr. Thomas Barton, of the firm of Abbott and Barton, advertising contractors, for neglecting to comply with the 26th section of the Act of 1862, which directs that, within 14 days after every annual meeting of any company registered under the Act, a classified list of shareholders and past shareholders shall be sent to the Registrar of Joint-Stock Companies. The 27th section imposes a penalty not exceeding £5 for every day during which such default continues, and also on the directors and manager, if they shall have knowingly and wilfully permitted such default.

Mr. GEORGE LEWIS appeared in support of the summons, and Mr. MONTAGUE WILLIAMS defended the company.

Mr. LEWIS briefly stated the case, and contended that it could be no excuse for a breach of the law to allege, as was the case here, that no meeting had been held; because section 49 provided that a general meeting should be held once, at least, in every year, and the infraction of one section could not be cured by the breach of another. Nor could it be pleaded that the defendants were ignorant of their duty, because they were constantly attending at the office, were entitled under the articles to £1500 a year for their services, and one of them was a solicitor.

Mr. *Spier*, a clerk in the office of the Registrar of Joint-Stock Companies, produced the register showing that no list had been furnished, as required by law, from Dec. 20, 1872, down to the time of the summons being taken out. A list had, however, been sent in since. He also gave particulars of the capital of the company, and the number of shares which had been taken.

Mr. *Barton* said he had advertised the prospectus of the company, his account being about £1450. He had received £800 in cash, and for the balance had agreed to take fully paid-up shares; he had never received the shares, nor had he ever received any report, or been summoned to any meeting. Since the issue of the summons he had received notice of a meeting for the 31st, but no report.

Mr. M. WILLIAMS then applied for an adjournment, which was granted.

Yesterday morning (Monday), the hearing was resumed, when Mr. Williams contended, in the first place, that as no meeting had been held, according to the case for the prosecution, no offence had been committed, as the list was to be sent in within 14 days after the meeting, not after the time for holding the meeting.

The LORD MAYOR having overruled this objection,

Mr. WILLIAMS next argued that the summons was premature, because a meeting had been held in November, 1872, and as the company was registered in July of that year, that fulfilled the obligation of the Act up to July, 1873; and that if a second meeting were held before July, 1874, which would be two years after the registration of the company, the section requiring one meeting at least to be held in every year would be satisfied. He was prepared with an opinion, by two equity counsel, to this effect; but

Mr. LEWIS objected to its reception, especially as he elicited that it was only obtained on the 28th of March. Mr. Lewis also asserted that the meeting of November, 1872, was not an ordinary general meeting, but the statutory one required to be held within four months of the time of registration.

The LORD MAYOR, in giving judgment, said he was clearly of opinion that the Act of Parliament had been broken, and therefore he had no alternative but to inflict a penalty. And after looking through the minute-book, and finding that the directors had been pretty constant in their attendance, he was obliged to come to the conclusion that they had knowingly and wilfully permitted the default. It appeared that neither in 1873 nor in 1874 had the list required by the Act been furnished, and, therefore, saying nothing about the former year, he should inflict a penalty on the company of £5 for the first day, and 1s. a day since, up to the date of the summons, making £8 3s. The directors would each be fined £1 for every day they had attended the meetings and neglected their duty during 1874—viz.: Mr. Andrews, £8; Mr. Church, £5; Mr. Glaisher, £5; Mr. Suart, £9; and Mr. Witham, £6. The secretary and manager he should inflict a heavier penalty upon—viz., 10s. for each of the 64 days of 1874 during which he had made default, or £32.

Mr. WILLIAMS asked his lordship to grant a case for the Court of Queen's Bench on the two legal points he had raised.

The LORD MAYOR said he would consider the question, and give his decision in a day or two.

On the application of Mr. LEWIS, the Lord Mayor directed that the costs of the prosecution should be paid out of the penalties.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, MARCH 23, 1874.

The following Bills were read a first time:—Alliance and Dublin Consumers Gas; Broadstairs Water (No. 1); Fairfield Local Board; Hartlepool Gas and Water; Llanelly Gas; Nottingham Water; Wrexham Water; Ystrad Gas and Water; Beverley Water; Broadstairs Water (No. 2); Dublin Corporation Gas; Enniskillen Gas; Leeds Corporation Water, &c.; Middlesborough Extension and Improvement; Neath Corporation; Nottingham Gas and Water; Shipley Local Board of Health; Westleigh, Pennington, and Bedford Local Boards.

TUESDAY, MARCH 24.

The LORD CHANCELLOR acquainted the House that the further Standing Orders applicable to the following Bills have been complied with:—Broadstairs Water (No. 1); Alliance and Dublin Consumers Gas; Ystrad Gas and Water; Nottingham Water; Fairfield Local Board; Wrexham Water; and that they have not been complied with in the case of the Hartlepool Gas and Water Bill.

Hartlepool Gas and Water Bill, together with the Examiner's Certificate, referred to the Standing Orders Committee on Thursday next.

A petition against the Dublin Corporation Gas Bill was presented from the Alliance and Dublin Consumers Gas Company.

THURSDAY, MARCH 26.

The LORD CHANCELLOR acquainted the House that the further Standing Orders applicable to the Llanelly Gas Bill have been complied with.

The Standing Orders Committee reported that the Standing Orders not complied with in respect of the following Bills ought to be dispensed with, and the Bills allowed to proceed:—Hartlepool Gas and Water, provided that proof be given before the Examiners that the Bill has been approved of at a further meeting of the company called and held in accordance with the requisitions contained in Standing Order No. 185, sec. 1; Shipley Local Board of Health, provided that the powers given to the churchwardens and overseers of the township of Shipley to grant, by way of gift, to the Local Board the lands described in Parts II. and III. of Schedule A, be struck out of the Bill.

FRIDAY, MARCH 27.

The following Bills were read a second time:—Beverley Water; Broadstairs Water (No. 2); Dublin Corporation Gas; Enniskillen Gas; Leeds Corporation Water, &c.; Middlesborough Extension and Improvement; Neath Corporation; Nottingham Gas and Water; Westleigh, Pennington, and Bedford Local Boards; Broadstairs Water (No. 1); Alliance and Dublin Consumers Gas; Ystrad Gas and Water; Nottingham Water; Fairfield Local Board; Wrexham Water; Hartlepool Gas and Water; Shipley Local Board of Health; Llanelly Gas.

Petitions were presented against the Nottingham Water Bill, by the Corporation of Nottingham; and against the Wrexham Water Bill, by the Ruabon Water Company.

HOUSE OF COMMONS.

MONDAY, MARCH 23, 1874.

The following Bills were read a first time:—Wigan Improvement; Dundee Water; Truro Water; Musselburgh and Dalkeith Water.

METROPOLIS GAS BILL.—A petition for reinsertion of Bill in "General List of Petitions" was presented from George Flintoff.

Petitions were presented against the Fylde Water Bill, by John Gordon M'Minnies and Peter Ormrod; and against the South Lancashire Water Bill, by the Horwich Local Board of Health.

TUESDAY, MARCH 24.

The Mid-Lothian Water Bill was read a first time.

A petition was presented against the South Lancashire Water Bill by the West Houghton Local Board of Health; and against the Wigan Improvement Bill by the Leeds and Liverpool Canal Company.

BOARD OF TRADE REVISION COMMISSIONERS.—Mr. GOLDNEY gave notice that on Thursday, March 26, he would ask the President of the Board of Trade if he would lay upon the table of the House, a copy of the opinion of the Law Officers of the Crown, to the effect that the Board of Trade Commissioners, in settling the price of gas to be paid by the public, are precluded from inquiring into the mode in which the gas companies have raised or expended their capital.

WEDNESDAY, MARCH 25.

A petition against the Belfast Water Bill was presented from the Marquis of Downshire.

THURSDAY, MARCH 26.

METROPOLIS GAS BILL.—A petition against reinsertion of petition for Bill in the "General List of Petitions" was presented from the Imperial Gaslight and Coke Company.

The following petitions were presented:—Against the Birmingham Gas Bill, from the Corporation of Birmingham; and against the Wakefield Water and the Wakefield and District New Water Bills, from the Manchester, Sheffield, and Lincolnshire Railway Company.

BOARD OF TRADE REVISION COMMISSIONERS.

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Sir C. ADDERLEY: There is no such opinion of the law officers as the question implies. There is an opinion given by Sir J. Karslake, Sir R. Baggallay, and Mr. Round on a question referred to them as to the powers of the commissioners appointed by the Board of Trade on the application of the Imperial Gas Company's Act, 1869, to revise the scale of illuminating power. I am about to present the minutes of the proceedings of the commissioners for 1873 and 1874, as soon as they are concluded, which will include the opinion referred to.

METROPOLIS WATER SUPPLY AND FIRE PREVENTION.—Mr. Beresford's motion, of which notice was given for this day, was postponed to Tuesday, March 31.

FRIDAY, MARCH 27.

The following Bills were read a second time:—Belfast Water; Cupar Water; Dublin Corporation Water; Edinburgh and District Water; Horbury Local Board; Hythe Improvement and Water; Lymm Water; Skipton Local Board of Health; Ulverston Local Board; Wakefield and District New Water.

Petitions were presented against the Padiham Water Bill, by Ughtred James Kay Shuttleworth and others; and against the Wakefield Water Bill, by the Horbury Local Board of Health.

SATURDAY, MARCH 28.

METROPOLIS GAS BILL.—A petition against reinsertion of petition for Bill in the "General List of Petitions" was presented from John Field and others.

Petitions against the following Bills were presented:—Dundee Water, by Catherine Laird; Horbury Local Board, by Wakefield Water-Works Company; Padiham Water, by Le Gendre Nicholas Starkie; South Lancashire Water, by Earl of Bradford and William Jackson Rideout, and Richard Henry Ainsworth; Wakefield and District New Water, by Wakefield Water-Works Company.

Miscellaneous News.

PROPOSED TRANSFER OF THE BIRMINGHAM GAS COMPANIES TO THE CORPORATION OF BIRMINGHAM.

BIRMINGHAM TOWN COUNCIL.

A Special Meeting of the Town Council was held on Tuesday last, the 24th inst.—the MAYOR (Mr. J. Chamberlain) in the chair—"to consider the proposal for the purchase and transfer of the properties of the Birmingham Gas Company, and of the Birmingham and Staffordshire Gas Company, to the corporation."

The MAYOR moved the adoption of the report of the General Purposes Committee upon the subject, which was adopted. He then moved—"That the following terms of arrangement for the purchase, by the mayor, alderman, and burgesses of this borough, of the undertakings of the Birmingham and Staffordshire Gaslight and Coke Company, and the Birmingham and Staffordshire Gaslight Company, be, and the same are hereby approved; that is to say:—

Terms for the Sale of the Undertakings of the Birmingham Gaslight and Coke Company to the Corporation of Birmingham.

1. The price is £450,000, and the sale includes the entire undertaking of the company, but does *not* include the profits of the company from June 30, 1873, to the time when the corporation shall take possession, which profits shall belong to the company, and shall be apportioned, if necessary; and is subject to the corporation discharging all the liabilities of the company to the day of taking possession. The reserved fund and undivided profits on June 30, 1873, amounting to £6017, *are* included in the purchase.

2. Until the time of taking possession, the company shall carry on and manage their undertaking as heretofore, and continue the works in good and proper order, and also continue to keep proper accounts. All payments which, if the sale had not been made, the company would have charged to capital, shall be so charged; and any difference on this point shall be settled by arbitration.

3. If and when the agreement is confirmed by Parliament, the corporation shall be entitled to possession of the undertaking on securing to the company, by covenant and charge (primarily on the undertaking, and secondarily on the other property of the corporation), £5 per cent. interest on the purchase-money until actual payment.

4. The company shall allow their bill now before Parliament to be amended by the omission of the power to take land and raise money, and the insertion of a confirmation of the agreement embodying these terms, and of the concurrent agreement with the Staffordshire Gas Company; and the corporation shall concur with the company in all proceedings necessary to effect this in the session of 1874. If the bill cannot be so amended in the session of 1874, the company shall withdraw it, but shall be at liberty to introduce and prosecute a similar bill in the session of 1875, if the agreement embodying these terms be not confirmed by Parliament in the session of 1875. The company may themselves also (in case of default by the corporation), introduce a bill to confirm the agreement. If the agreement be not confirmed before Aug. 1, 1875, the arrangement to be at an end.

5. The corporation to pay all costs incident to the agreement, and to the withdrawal and renewal of the application to Parliament, so that on completion the shareholders may receive the agreed purchase-money and profits from June 30, 1873, clear.

Terms for the Sale of the Undertaking of the Birmingham and Staffordshire Gaslight Company to the Corporation of Birmingham.

1. The corporation to purchase the entire undertaking of the company, with land, buildings, works, and other property belonging thereto, and all the rights, powers, and privileges connected therewith, as the same shall stand on the completion of the purchase, subject to all then existing provisions, enactments, mortgages, contracts, and liabilities affecting the same, and subject to the exception mentioned in term No. 2.

2. The reserve-fund, as it shall stand on the completion of the purchase, and the profits now undivided, and that may accrue before the completion of the purchase, shall be excepted out of the purchase, and shall belong, and be paid to, or retained by, and be at the absolute disposal of, the company.

3. The corporation to pay to the company the sum of £10,906 (in lieu of a like amount, the application whereof was confirmed by section 54 of the company's Act of 1864), and to guarantee to the company, or their shareholders or nominees, in perpetuity, annuities equal in the aggregate to an amount sufficient to pay the maximum dividends on the company's authorised share capital, it being understood that the £4 per share now unpaid on the £28 shares shall be called up previously to completion.

4. The annuities to be charged primarily on the gas undertaking, gas rates and rental; and, secondarily, on the property for the time being of, and the rates from time to time leviable by, the corporation or for their benefit.

5. Until the purchase is completed, the company to carry on and manage their undertaking as heretofore, and to continue to keep the works in good and proper order, and also to continue to keep proper accounts.

6. The purchase to be completed on Jan. 1, 1875, and if not completed on or before Jan. 1, 1876, the company, without prejudice to any other rights, to have the option of terminating the contract.

7. The corporation to make and prosecute with all possible despatch the necessary application to Parliament for confirmation of the arrangement, and for legalizing and effectually securing the annuities.

8. The corporation to bear and pay all costs.

That the General Purposes Committee be, and they are hereby authorized and instructed, in the name and on behalf of the council, and under the corporate common seal, to do the following acts, namely—To enter into agreements of the sale and purchase with the said companies respectively on the basis of the foregoing terms of arrangement respectively; to cause to be stated at a meeting of the ratepayers of the borough, to be held in the town-hall on some convenient day to be fixed by the mayor, the objects of an intended application to Parliament for the confirmation and carrying out of the said agreements respectively. In case the ratepayers so authorize to procure the amendment of the bill of the Birmingham Gaslight and Coke Company now before Parliament, or to make an application or support any other application to Parliament they (the said committee) may deem necessary or expedient for the completion of the purchase of the said undertakings respectively, and for conferring on the mayor, aldermen, and burgesses all usual and necessary powers in relation thereto.

He did not think he need dwell on the vast importance on the matter under consideration. Should it come to a successful issue, he thought it would be unparalleled in the history of provincial corporations, and he could only hope that its success would be equal to its magnitude and importance. Though this matter was of such colossal magnitude, the issues upon which the council would be called to decide were extremely simple and free from complication. He did not think it was necessary to say anything in favour of the principle upon which these negotiations had proceeded, for that was conceded on the 13th of January, when the council resolved, by a very large majority—"That, in the opinion of this council, the manufacture, supply, and sale of gas should be under the control of the corporation." He would only remind the corporation that, in addition to any direct pecuniary advantage, the council would obtain the control of a service of public utility—he might say necessity—and a more complete and independent jurisdiction over the streets of the borough. The importance of these considerations would, he was sure, be fully appreciated by the council. The question for them to consider was, whether the terms which had been arranged offered sufficient inducement for the ratepayers to assume this new and great responsibility. The General Purposes Committee, to whom the matter was referred, appointed Messrs. Carter and Carter and Mr. Percival to examine respectively the accounts of the Birmingham Gas Company and the Birmingham and Staffordshire Gas Company, and they appointed Mr. Jones, C.E., to report upon the mechanical condition of the works. Mr. Jones was a gentleman with a recognized position as an engineer, and with special experience in gas undertakings; he was the engineer to the Commercial Gas Company, London, and had been engaged in several matters like the present. The reports of these gentlemen had been before the members of the council for some days; they were extremely interesting and important, and no doubt they had carefully examined them. There were facts in them which would be more useful when they came to consider the conditions of amalgamation, if matters proceeded further; but there were one or two facts to which he would draw their attention, and which were the crucial facts upon which they would base their judgment as to the propriety of concluding the transfer. Mr. Jones was asked to report specially as to the condition of the works. He did so, and made further suggestions as to their management, if they came into the hands of the corporation, which he would not call their attention to at the present time. It might, however, have happened that though in profitable operation now, the works might have been

nearly worked out, so as to be almost valueless; the directors might have been working to death a profitable undertaking; the works might be so old fashioned that the corporation would have to expend large sums of money to bring them up to a proper stand-point. That was not a mythical case. When the Leeds corporation purchased the gas-works, they found one of the works so bad that all the profits which they expected were for the first few years expended in necessary repairs and alterations. Upon this head he ventured to say Mr. Jones's report was perfectly satisfactory. He spoke of all the works in high terms of praise, excepting the Fazeley Street works—the least important of all—the abandonment of which it would be worth while to consider should the negotiations proceed. Reading from a letter written by Mr. Jones, the mayor quoted that gentleman's opinion, that with judicious management he "hesitated not to repeat that the corporation would possess one of the best gas properties in the country." Mr. Jones's opinion was confirmed by the accounts. Mr. Percival stated, in reference to the Birmingham and Staffordshire Company, that the amount charged to revenue for repairs during the last two years was £42,123, or £21,000 per year. There had evidently been no sparing of money on this head, because, having gone into the accounts for ten years, he discovered that during that time no less a sum than £184,782 had been written off for keeping the works in a proper state of efficiency; and, during the same period, £71,391 had been written off for depreciation of property; making together upwards of £250,000, or £25,000 per annum. Messrs. Carter and Carter stated that, on the works of the Birmingham Gas Company, about £6000 per annum was charged to revenue for improvement, and, in their opinion, such large sums spent half yearly could not continue. On the whole, then, he ventured to say, on this part of the case, that the council might enter on the negotiations with the most perfect confidence in the substantial and *bonâ fide* character of the undertaking. There was one other matter of some importance, and that was whether there were any liabilities of an embarrassing character in connexion with the properties, because they took to all the assets and liabilities. He found, in reference to the old company, that as regarded contracts the only contract in existence was the ammoniacal liquor contract, which would expire seven years hence. The terms of the contract were perfectly satisfactory, the amount of this residuum was comparatively very small, and the matter need excite no apprehension. All the other contracts were such as would expire about the same time as the completion of the agreement. There was also a liability with respect to two lawsuits, and he wrote to the solicitors to the company on the subject, and in their reply these gentlemen stated that there was some litigation pending between the company and Dr. Wrightson. The company claimed £175 0s. 2d. from Dr. Wrightson, for not purifying their gas according to contract; and there was a cross-action in which Dr. Wrightson claimed £150 from the company for services rendered. They stated that Dr. Wrightson's action was not commenced until after he knew that the contract with him would not be renewed, and regarding the other lawsuit, they said there must be some mistake, as there was no action with the water-works company. There was some question concerning a well between the gas company and an owner of property, but the amount at issue was only £11 per annum. With regard to pensions, Messrs. Carter and Carter said they would be less than £200 per annum. In the case of the Birmingham and Staffordshire Company there was a long contract for ammoniacal liquor which would expire in 1880. The strength of this liquor varied, and with the strength the price changed. *Primâ facie* the price which the Birmingham and Staffordshire Company were obtaining appeared less favourable than that obtained by the old company, but the amount of the sale of this article was of small comparative importance. In respect to tar contracts, there was a large advantageous contract just concluded at a time of high prices, and it extended over a considerable time. The pensions only amounted to about 10s. per week, paid to two old servants of the company. He thought there was nothing more which called for remark in these reports of the accountants and engineer, excepting the calculation as to the probable future profits. He should ask their attention to that in connexion with the terms suggested between the two companies. These terms were submitted to the absolute discretion of the council, but he did not think that the directors would be willing to submit any important modification of them to their shareholders. The council were aware that the Birmingham and Staffordshire Company had paid their maximum dividend for some years, and there was no doubt that they had earned it, for Mr. Percival found traces of the payment of it in cash in the books. The terms which were proposed to the corporation were these—that they should take to the whole property, guaranteeing the maximum dividend of 10 per cent. upon the present authorized capital. The company would retain their reserve-fund for the shareholders, and this they were justified in doing, as it was surplus profits of past years, and they also claimed to retain a sum of £10,906, which appeared as capital not bearing dividend, which arose in this way. Some time ago the shares were issued at a premium, and this sum was the product of the premium. In this case also they appeared to be justified in the course they took. He ought to say that in the first instance the Birmingham and Staffordshire Company wished the corporation to guarantee the income-tax upon these annuities, they having paid their dividends free of this charge. The General Purposes Committee took a very strong objection to such payment, and the demand had been subsequently entirely withdrawn. In this negotiation no money passed between the corporation and the company, so they need not fear that the credit of the corporation will suffer by their raising a million and a half of money. The whole transaction consisted of their taking the properties, guaranteeing the maximum dividend, and then taking the surplus profit. The whole of the authorized capital was £670,400, which was made up of £320,400 bearing 10 per cent. dividend, which produced £32,040 per annum, and £350,000, bearing a maximum dividend of 7½ per cent. per annum, which meant £26,250. Add these two together, and they got the total liabilities of the corporation in respect to the property of this company—£58,290 per annum. And what did they receive in return? Assuming that, if the price of coal remained as at present, the present price of gas would be continued, and that if coal decreased in price the corporation would give the gas consumers the advantage, he assumed that the corporation would act precisely as the companies would have acted, had they remained in possession, and they would have charged just such rates as would be sufficient to secure their maximum dividend. Upon that assumption Mr. Percival estimated their future profits at £63,983 per annum; deduct from that their liabilities, £58,290, and they had the immediate profit of £5963 per annum. Then, however, there were directors fees. Unfortunately, the corporation did not receive these little *douceurs* for the labour which it performed for the good of the town; they only got their reward in the respect and esteem which was paid by the ratepayers to every member of the council. He believed that the corporation would transact the business of this company as efficiently as it had been transacted by the directors, and would not charge £1200 per annum for doing it. He added the £1200, therefore, to the profit, and that made £6893. But that was not all—they had to pay the maximum dividend on the authorized capital, of which £50,000 remained uncalled. That would be called up by them as a part of the authorized capital. They had to pay out, it would be remembered, £10,906 for capital not bearing interest. Deducting that £10,000 from the £50,000, they should receive £40,000 in cash, which would relieve them from the necessity of obtaining £40,000 on loan at 4 per cent.—say £1500—which, added to the profit, raised it to £8393. But he had still a little nest-egg in the shape of the income-tax, which, having been charged by the company as part of the costs of the manufacture of gas, would now have to be paid by the shareholders as a necessary tax upon income. At the present sum, 3d. in the pound would amount to £728; but, for the sake of getting equal figures, call it £607, and they got a final total present income beyond expenditure of £9000 as the profit obtainable by this corporation in the first year by the transfer to it of the property of the Birmingham and Staffordshire Gas Company. He would now consider the terms of the other company. That negotiation had been attempted on a different basis. Instead of guaranteeing the maximum dividend in perpetuity, they took to the works and the property, "lock, stock, and barrel," of the undertaking, the sum agreed upon being £450,000. But there happened to be a reserve-fund of £6000, which the directors were very anxious to secure for their shareholders. They made piteous entreaties for it, but he was happy to say his committee turned the deafest ear to their petition. The net sum they would have to pay, therefore, was £440,000, and it was for the council to consider upon what terms they could raise that sum. He would take two figures for a basis, though his own belief was that they would not have the slightest difficulty in raising £1,000,000 at 4 per cent. However, he would take 4 per cent. as one basis, and 5 per cent., which was the uttermost extreme, as the other. Assuming they paid 5 per cent., it would cost £22,200 per annum. With regard to the profit, it might be safely estimated at £28,000 per annum. Deduct £22,200, and there remained £5800 as the profit obtainable by the corporation, supposing the purchase-money was obtained at 5 per cent. or at 4 per cent., it would be increased to £10,240. Putting the two companies together, they would find that if the corporation borrowed this money at 5 per cent., the total profit on the two transactions for the first year would be £14,800; or if the money were borrowed at 4 per cent., £19,240. There were still some other items which the council must take into account. He had not said a word concerning the saving in the cost of the collection of the gas-rates. If collected with their own rates, it might save almost the whole cost, and that amounted now to something over £4000 per year, and a large proportion of that sum might fairly be added to the estimated profit. Then there was the unknown, but still very important, saving in respect to the cessation of the necessity for a double service throughout the town; and lastly, there must be a considerable saving by the amalgamation of the staffs, in the salaries, which were necessarily heavier with a double than with a single staff. At his own request, the accountant, in his estimates, gave no credit for the last item, because he did not like to ask the council to consider purely speculative items, and also because he believed if these negotiations were to be completed, the council must make up its mind to pay the best possible price for the best possible assistance. Unless the council were prepared to deal most liberally with the servants employed by the companies, he earnestly advised them to have nothing whatever to do with the matter. These properties could only be successful if managed by a gentleman of experience and ability. There was a market price for that ability, and a very much higher one than any they had yet put upon the servants of the corporation. The corporation would find it to be the truest economy to remunerate these gentlemen highly, or the less they had to do with it the better. To review the whole matter once more, he considered that without these speculative items the corporation might rely upon making £15,000 to £20,000 in the first year, and in a few years it must of necessity make £25,000 per annum, even supposing there was no increase in the sale of gas. But now he asked their attention to that point of the probable increase in the sale of gas. He found from the reports of the Birmingham and Staffordshire Company that the sale of gas had increased at the rate of 5 per cent. compound, so that the sale of gas doubled at every 14 years. In the case of the Birmingham Gas Company, the sale had increased nearly 6 per cent. compound. Supposing it increased in the future at the rate of 5 per cent. compound, then 14 years hence the companies would be able to find their maximum dividend on double their present amount of capital. Their present capital was £1,000,000. They would be able to find—assuming that their maximum dividend was confined to 7 per cent. less than they paid at present—£70,000. It would only be requisite for the corporation to borrow the money at 4 per cent., and the difference between the 4 per cent. and the 7 per cent. would be a profit of £30,000 per annum. The general results were an immediate gain of £15,000 to £20,000 per year, and a gain in 14 years of £55,000 per annum, without in any way increasing the cost of gas to the consumer, beyond what it would have been if the companies had retained their property. There were only two matters which militated against these suppositions. First, the cost of transfer would have to be paid by the corporation. He did not know what the cost would be in an amicable transfer of this sort, but they would help to reduce the first year's profits. The second point was that Parliament might impose the necessity of a sinking-fund. But, supposing they did so, they would only have to deduct something for the benefit of future generations. It would be for the benefit of the town—of their successors instead of themselves. He believed they might not find it necessary in strict book-keeping to carry such large sums for repairs and depreciation as had been carried by the companies who had special reasons for not appearing to make a large profit for next year's dividend. That was the proposition which he had to make for their consideration. He did not desire to urge the council to any hasty or inconsiderate conclusion. At the same time, he was bound to point out that if the negotiations were to be carried on, a speedy and prompt conclusion was extremely desirable. He was informed by the solicitors to the companies, and by the town-clerk, that if the proposition was mutually adopted, it might be possible to get through the present session of Parliament a bill confirming the agreement. In that case, they should enter immediately upon the occupation of the property of the Birmingham Gas Company, and they should be in a position to enter into possession of the Birmingham and Staffordshire Gas Company in January of next year. In that way, they should not only secure an earlier possession of the advantages he anticipated for the town, but they would avoid those disadvantages which were certain to arise when one party was carrying on business for its successors whom it expected momentarily to fall into its shoes. The fact that he was not sanguine, when, on a previous occasion, he laid down the basis upon which at that time negotiations were conducted, would naturally lead them to assume that he was not over sanguine now in the much better resolution he had the honour to submit. He was convinced that result must be realized with ordinary capacity and honesty of management, and as he did not doubt for a moment the possession of those two necessary elements by the Corporation of Birmingham, so he felt perfectly safe in the arguments he had the honour to make. He thought the facts he had laid before them would justify the course he had taken in bringing that matter before their notice, and he hoped in securing the consent of the corporation.

Alderman HAWKES seconded the resolution.

Mr. LOWE opposed the proposition, and said he hoped and believed that the council would not, on that one occasion, settle so large and important a matter as to approve a resolution which they had just heard within the last few minutes. He should ask the council not to hurry this important business, but to give the fullest opportunity of thoroughly investigating the matter from beginning to end. He had no hesitation in stating that what was now proposed by the council was a gigantic experiment. The council ought not, under any circumstances, to become manufacturers of any article, inasmuch as their time was sufficiently occupied in attending to the ordinary business of the town, without going into the manufacture of gas or anything else. There must be a limit to the gratuitous services of the members of the council; but if they bought up the gas companies it might lead on to other things—it might lead on to water. He was surprised that that was not taken in hand earlier. They did not manufacture the water; it was manufactured by higher powers. If the spirit of the council was to go on with the monopolizing ideas in the minds of some gentlemen connected with that chamber, they would have more of these reresolutions. Already they wanted to take the management of the Grammar School. Were they sent for the purpose of superintending that educational establishment? Another idea was broached, that they should have charge of the Birmingham Proof-house—a small idea compared with the others, but it

showed that the notions of some members of the council would be to go on further. And it might be the idea of some prominent member of the council to go into the banking establishments, and claim the right to purchase all the banks, because they paid a good profit. That was his argument, that the monopolizing spirit of the council would lead them into that monstrous extremity. The mayor had told them candidly that the most they could get for some years to come would be from £15,000 to £20,000. All the expenses of a bill and the incidental expenses would have to be considered, and he ventured to say that the expenses connected with these negotiations would absorb all the profit for the first year, and they would not have a copper left to look at from the transaction. The advantages in the future were very uncertain. Supposing they had some new mode of lighting, where was their £1,500,000 gone? Then, what had they done for the town and for future generations? It might look very bright and pretty on paper, especially when it had gone through the hands of an accountant; but, looking as sensible practical men at the result of all these things, there was uncertainty about it. He was not at all surprised that the shareholders of the companies were most willing, in fact anxious, that the negotiations should go on.

The MAYOR: How do you know that?

Mr. LOWE said he had heard from a shareholder or two that they were looking upon this as one of the most profitable transactions they ever had to do with. It was a common-sense deduction from the facts they had before them. They had a certain amount of capital invested. The Act of Parliament said they could only get 7½ per cent., and the corporation were going to secure for them the maximum dividend in perpetuity, without the risk of any uncertainty for the future. It was an unmistakably good transaction, and they would be silly if they did not jump at it as they did. They not only got the maximum dividend in perpetuity, but also put into their pockets all the reserved capital they had put by.

Mr. DAVIS: They have earned it.

Mr. LOWE admitted that they had earned it. There was no contingency upon their side, it was all to their advantage; but whatever risk—and there must be some—that was run was altogether on the part of the corporation. They proposed to be the great gas monopoly of the district; they would do just what they liked when they got possession of these two great companies, and they would become one of the monstrous monopolies of the Midland Counties. What was their object in purchasing these companies? Was it not that the council might have the power and patronage that the position of these companies gave?—and to whom would this patronage be directed? He would not refer to the way in which it was likely to go. Cases had occurred where patronage had been given under peculiar circumstances, and it might again be so bestowed. With reference to the amount of dividend, it was a remarkable fact that in Birmingham they had gas cheaper than in any other town in England. Did not that show that there had been a fair and reasonable and honest competition in the manufacture of gas? and they had no right to assume that there had been anything unfair or unreasonable, or unjust on their part. Other companies, having the same facilities as they had, had not been able to manufacture gas so cheaply, because they had had a fair, legitimate, and honourable competition between two respectable companies. They had to go before Parliament for their bill, and it was right that they should go before the town and let them express their own opinion upon that great question. They were not sent there to buy gas companies, and he would like them to show a little more confidence in the burgesses. He questioned the propriety of making gas for the borough, and he hoped the council would hesitate before they passed this resolution in an unseemly hurry.

Alderman MANTON had read the terms of the transfer, and listened to the statement of the mayor, and he was convinced that all the mayor had led them to anticipate would be realized. As to the "gigantic monopoly," the monopolists were the burgesses of this great borough. The corporation were bound to light the borough, and it was not out of place to make the gas as well. Those who had the management of the gas companies told them that there was a considerable loss in conveying gas to great distances. In two sets of service, they had two distinct losses; and when they had but one main they would have but one loss. At the present time there were four parties who could break up the streets of the borough, but in a great town like this the corporation ought to have entire control over the streets, and they ought not to be subject to be broken up by other parties who were not equally responsible for the roads as the corporation were. Mr. Lowe said the shareholders were very anxious that these negotiations should come to a successful issue, but he had spoken to two of the largest gas shareholders, and they were not of the opinion of those of whom Mr. Lowe had spoken. With regard to the water-works, he hoped the mayor would be spared to carry it out, and, if not this year, that he would allow himself to be put in nomination another year for this purpose. If they had great responsibilities, they had great properties. He expected a reduction of the rates from this scheme, and he supported it on grounds of economy.

Alderman OSBORNE said he was not at first so sanguine as to the scheme, but, after giving the subject due consideration, he thought it was one that it would be well for the council to accept, on terms which he would endeavour to lay before them. If they reduced the price of gas, it might be applied to many other purposes for which it could not now be applied on account of its high price, and he hoped the profits would be applied to a reduction of its price. As to the terms of purchase, he would move that the following addition be made to the resolution:—"And that the said committee be authorized to negotiate for the carrying into effect of reasonable terms for the reduction of the annuities in the case of the Birmingham and Staffordshire Gaslight Company."

Alderman BIGGS seconded the amendment *pro formâ*.

Mr. BROOKE SMITH said it would be unfair to the consumers of gas if the profits of the manufacture were devoted to the reduction of the rates, and he hoped they would be protected against this.

Mr. STONE entirely agreed with the principle of the purchase of the gas companies, but he did not think that, in the case of the Staffordshire Company, they had sufficient information before them at the present moment as to the extension of their mains. He knew they went outside the borough, and supplied a large portion of the Black Country and of the town of Walsall. If they were going to buy up a manufacturing concern for supplying the town of Walsall, he wanted to know what the opinions of the Walsall people might be on the point. The people of Walsall might object to it; and if they went to Parliament for a bill the people of Walsall and the surrounding districts might lodge a bill against them. He saw coal was put down at £35,000. Assuming that that was estimated, coal had gone down within the last week or two to such an extent that this sum would be reduced by £6000 or £7000. There was also £50,000 uncalled-up capital, and if they forced a call up of that capital of £50,000, and guaranteed to pay upon that a maximum dividend of 10 per cent., and raised money at 4 per cent., that would be a loss of £6000 or £7000 a year off the profits.

The MAYOR: I beg pardon; nothing of the kind. The difference between 3½ and 7½ is only about £1700. It has all been calculated.

Mr. STONE said, with respect to the management, the few hundreds that would be saved in directors fees they must pay for the able supervision of the concern which the directors now gave. If they were to have one set of mains, they must be of double capacity, inasmuch as the companies were now engaged in taking up the small ones and laying down the larger. The main point he would press upon the committee to reconsider would be the negotiation of the loan of £450,000. He certainly agreed with Alderman Osborne that they should make arrangements to pay off these annuities, and he thought the same arrangement should be extended to the other company.

Alderman CORNFORTH regarded the bargain as an imprudent one, and one into which they should not enter on the fragmentary statement laid before them, and in such a short time to lay upon the necks of the ratepayers nearly a quarter of a million of debt more than the entire rateable value of property in the borough. He fully agreed that it was desirable that the manufacture of gas should be in the hands of the Town Council. He had always supported every advance in that direction; but it was possible to buy gold too dear, and before they entered into a bargain involving the borough to such a fearful extent, they ought to have a detailed account before them in order to study it carefully, and make up their minds whether it was prudent to enter into that negotiation or not. He agreed with Alderman Osborne, that there should be some provision made for the reduction of the stock, in order that the property might come into the hands of the burgesses entirely. He objected to the resolution because the information was not sufficient to convince his mind, because of the fearful risk involved in the form in which that bargain was drawn, and the utter abnegation of the interests of the corporation.

Mr. BARROW said the offers made to the council that day would certainly never be renewed in that form, and if they put off the purchase they would have to pay a higher price some years hence. In the city of Manchester, in the year 1871-1872, he found out of the profits of the year, after deducting £22,288 for depreciation, £17,000 had been paid over to the improvement department of the corporation, and £27,000 was transferred to the capital account towards the liquidation of the mortgage debt.

Alderman BIGGS thought this would be one of the best day's work of the council, and he very much regretted that they had not purchased the water-works. He hoped, from the very slight opposition which had been manifested, the resolution would be passed unanimously.

Alderman BRINSLEY hoped the question would be left to the ratepayers to settle

Alderman AVERY moved that the debate be adjourned until Tuesday, the 31st inst.

Mr. LEWIS seconded the motion.

The MAYOR said Alderman Avery's motion raised a point of order. On a previous occasion, when the adjournment of a debate was moved, he thought it his duty to take such a proposal as an amendment to the original resolution. That course, however, led to very considerable inconvenience. But he would now, in order to carry out the wishes of the council, put Alderman Avery's motion to the vote at once. He only desired to say that he left the matter wholly in the hands of the council. He did not wish the members of the council to come to a conclusion before they had made up their minds, although there were strong reasons why no unnecessary delay should take place in arriving at a settlement. If the members had already made up their minds, it would be better, therefore, to come to a conclusion then.

Mr. BROOKS SMITH: Are shareholders allowed to vote?

The MAYOR: Shareholders may not vote. I may also add that if any person who has a pecuniary interest in the companies takes part in the discussion, he subjects himself to a heavy penalty.

A division was then taken, when there appeared, for the adjournment 13, against it 31, two members remaining neutral.

The motion for adjournment was accordingly lost.

Alderman AVERY said, as his motion had been lost, he wished to make a few observations upon the important subject before the council. The question mainly for the council to consider was, whether it was desirable or not for them to purchase the gas-works? He was clearly of opinion that it was desirable to make the proposed purchase. His only desire in submitting his motion was to enjoy a further opportunity for more completely mastering the great mass of figures and details contained in the report. The supply of gas was a monopoly, and as it was the monopoly of an article that entered into almost universal consumption, the supply of gas should, he thought, be under the control and management of the representatives of the people. Then the question arose as to the terms. He thought the terms were fair. It was true, however, that they were to the advantage of the shareholders of the companies, although he believed they would also, in the long run, be eminently beneficial to the town. The capital of the companies would be greatly increased in 15, 20, or 25 years. Those would be of that opinion, at all events, who, like Mr. Barrow, had confidence in the future. He, at least, believed the capital would go on increasing, and he had no doubt that the progress of the past would be repeated in the progress of the future. Within the next 15 or 20 years from the present time the capital of both companies, he believed, would be at least double what it was now. During the present year, indeed, one of the companies was applying to Parliament to increase their capital by £300,000. The present plant of the Staffordshire Company would also prove unequal in course of time to supply the wants of the public. What would take place then? Another large increase of capital would require to be made, and that capital would enjoy 7½ per cent. interest. Who would have to pay that? It would fall either upon the public or the gas consumers, and it would be for the corporation to determine that point in some manner which was just and equitable. Another thing was as to the cost of the plant at the present time, and the allowance which should be made for repairs and depreciation.

The MAYOR: £184,000 was written off for repairs, and £71,000 for depreciation in regard to the Staffordshire Company. That was in ten years only.

Alderman AVERY said that showed in a very strong manner what the actual cost of the plant had been. They must also recall the time when iron cost £2 15s., £3, £3 5s., and £4 a ton, and when the price of labour was in the same proportion. One of the speakers—Alderman Brinsley, he believed—had referred to high price of gas in Manchester, with the view of showing that it was only by charging a high price—much higher than was charged for gas in Birmingham—that the corporation derived any profit. But it should also have been stated that the illuminating power of the gas in Manchester was from 25 to 30 per cent. higher than that supplied in Birmingham. He believed the difference between the illuminating power in Manchester and Birmingham, and the respective price of gas in the two towns, bore as nearly as possible a fair comparison the one with the other. Ordinarily, the illuminating power in Manchester was 25 per cent. higher than in Birmingham. The illuminating power here was some 15 candles, but in Manchester it was 23, 24, and sometimes 25 candles. Therefore the gas consumers had no reason to apprehend any serious consequences supposing the same results should follow in Birmingham. The coal used in Manchester was usually cannel coal, giving a higher illuminating power, and the gas consumers were thus fully compensated for the higher price paid. Practically, it was precisely the same thing. The corporation must, undoubtedly, once for all, make up its mind whether or not it would complete the proposed purchase. He himself had wished for more time, but as his motion had been defeated he should vote for the motion submitted by the mayor. He believed—taking a comprehensive view of the case—that the purchase of the gas-works was eminently calculated to promote the interest of the town, and that it was a safe and prudent transaction; that, though the town was incurring responsibilities of a very large amount, those responsibilities, to be accurately appreciated, must be measured by the means the council would have of meeting them. They might, he believed, regard the future with some confidence, and he should vote for the motion.

After some further conversation,

The MAYOR replied, and said he would be glad to incorporate Alderman Osborne's amendment with the original motion.

The motion for adopting the report, with Alderman Osborne's amendment incorporated, was then put to the vote and carried, Mr. Lowe being the only gentleman who voted against it.

Birmingham and Staffordshire Gas Company.

The Annual General Meeting of the Shareholders of the Birmingham and Staffordshire Gaslight Company was held on Tuesday, the 24th, at the Offices, Old Square—Mr. Wm. Sharp (chairman) presiding.

The following report and statements of account were submitted:—

Your directors have pleasure in laying before you the half-yearly report, with a statement of the accounts ending the 31st of December last, showing a balance available for dividend of £23,270 5s. 7d. In announcing that your directors recommend that the usual dividends be paid, they think it right to state that owing to the maintenance in the price of coal and every other material for making gas, and to the fact that the increase in the price of gas did not take effect until the second quarter of the half year, the profits do not allow them to do so without drawing upon the reserved fund the sum of £3218 9s. 5d. The additions to the works at Saltley, mentioned in a former report, are now finished, and in work. Your directors further report that the works at all the stations are most efficient, and that both the purity of the gas and its illuminating power are, as confirmed by the testimonies of Dr. Letheby and the borough inspector, in every point of view satisfactory.

Dr. *Profit and Loss Account, Dec. 31, 1873.* *Cr.*

Coals	£114,372	17 4	Balance brought from last half year's account	£11,378	7 4	
Purifying materials and process	2,573	12 11	Amount taken from reserve-fund	13,672	17 8	
Repairs and maintenance of meters, mains, service-pipes, and other works	11,633	5 8	Sale of gas, after deducting £6000 for estimated discounts and bad debts	107,902	4 2	
Wages	12,589	1 6	Coke and breeze	53,921	1 5	
Lamps (providing, lighting, extinguishing, cleaning, and repairing)	1,430	9 3	Tar and other residuals, and fittings	14,871	18 10	
Rates and taxes	3,593	16 6	Rents	349	18 6	
Salaries, collectors commission, and payments to directors	4,738	1 0				
Interest on loans	1,141	0 3				
Professional charges and incidental expenses	1,173	9 2				
Dividends paid to proprietors—viz., 10 per cent. per annum on £320,400.						
Capital raised under Act of 8 and 9 Vict., cap. 66	16,020	0 0				
Seven and a half per cent. per annum on £250,000 for six months, & £12,500 for two months, raised under Act of 21 Vict., cap. 1	9,531	5 0				
Miscellaneous	449	3 9				
Balance carried to next half year's amount	23,270	5 7				
	£202,596	7 11		£202,596	7 11	

Dr. *Balance-Sheet, Dec. 31, 1873.* *Cr.*

Capital raised under Act 8 & 9 Vict. cap. 66	£320,400	0 0	Cost of works, June 30, 1873 £593,225 1 7			
Do., 21 Vict. cap. 1	237,500	0 0	Add extensions made during the half year. 26,321 2 4			
Do., 27 & 28 Vict., not bearing dividend	10,906	0 0		£619,546	3 11	
Calls prepaid	3,637	0 0	Amount invested of the reserve-fund	42,942	19 7	
Amount of loans	61,975	0 0	Calls unpaid	215	0 0	
Reserve fund	30,365	8 6	Amount owing to the company for gas, coke, residual products, fittings, &c. (exclusive of estimated discounts and bad debts)	124,079	16 6	
Amount owing by the company	77,446	9 10	Coals in stock	32,216	15 6	
Unclaimed dividends	235	5 9	Residual products, & other stock	11,672	0 9	
Balance as above	23,270	5 7	Cash in hands of treasurer and cashier	5,062	13 5	
	£835,735	9 8		£835,735	9 8	

The Chairman, in moving the adoption of the report, referred to the amount of £3218 9s. 5d., which would have to be taken from the reserve-fund, in order to enable them to pay the usual dividends, and stated that this was a small sum compared with what other companies had been obliged to draw from their reserve to make up their dividend. One London company had to withdraw from the reserve-fund the sum of £40,000. He thought, with the increase that they had made upon the price of gas, that they would be able shortly to recoup the amount they had drawn from the reserve.

Mr. Wiggin seconded the motion.

Mr. Edwards asked whether, if the price of gas had been raised at the commencement of the half year, there would have been more than sufficient to pay the dividend without touching the reserve.

The Chairman answered in the affirmative.

The motion was then agreed to.

The Chairman then moved—"That a dividend be now declared at the rate of 10 per cent. per annum on the capital raised under the Act 8 and 9 Vict., and 7½ per cent. per annum on the capital raised under the Act 21 Vict., payable at the bank of the Birmingham Banking Company, Limited, on Wednesday, March 25, 1874."

Mr. Wiggin seconded the motion, which was agreed to.

The meeting was then made special for the purpose of considering the question of the proposed transfer of the undertaking of the company to the corporation.

The Chairman said that in asking them to give their sanction to the sale of the gas-works to the Corporation of Birmingham, the directors felt they would be doing that which would be most satisfactory and pleasing in its issue. The directors, as a body, were all agreed upon the subject, and they felt that they ought to give, and would give, the shareholders all the information they possibly could to enable them to sit in judgment upon the matter. For that purpose they had printed the terms of the proposed sale, and copies were in the hands of all present. Any questions they might put would be answered by the solicitor; whom he called upon to read the terms of sale.

Mr. Evans (solicitor) read the terms as read before the council.

Mr. Walker said that annuities generally meant payments terminable with a person's life. He asked what it meant in this instance.

Mr. Evans pointed out that the word "perpetuity," in the third clause of the terms, pointed out the meaning of the word "annuities." The terms he had read were but the heads of the arrangement. In anticipation of the conclusion which the shareholders might come to, to sell the works, the town-clerk and himself had drawn up a formal draft agreement.

Mr. Marlow asked who was to pay the income-tax, and also desired to know what was the sum of £10,906 referred to.

Mr. Evans thought he had better explain the whole matter. At present they were working under two Acts of Parliament, as regarded their capital. The Act of 1847 enabled them to raise £320,400, on which they were entitled to pay 10 per cent.; and the Act of 1858 authorized them to raise £350,000 more, on which they could pay a dividend of 7½ per cent. The whole of the capital under the earlier Act was paid up long ago, and the whole of the capital under the Act of 1858 was allotted; but all the shares were not taken up by the original allottees, and the directors sold those remaining in the market for £10,906, so that amount was really floating capital. In 1864 they went to Parliament, and fearing that something might be said by parties interested, they thought it would be well to legalize their position, lest they should be compelled to pay that amount over to the reserve-fund. In their Act of 1864, they recited the fact that they had realized this sum of money, and had expended it in improving the works. They obtained parliamentary confirmation of their application, that the sum of £10,906 should not be entitled to dividend. The company had always declared their dividends after deducting the income-tax; in other words, they had paid the amount of the income-tax for the proprietors. There was a great difficulty in granting an annuity which would be equal to the dividend and the income-tax, as the income-tax was a floating amount. That had not been overlooked in discussing the terms with the proposed purchasers, and they would see that they were obtaining for the shareholders not merely annuities equal to the amount of the dividend, but a considerable sum in cash. For instance, the reserve-fund, whatever it might be, would be available for distribution among the shareholders, as well as the £10,906, because it was conceded by the mayor when he opened the negotiations that both these sums did in reality form part of the assets of the company, and belonged to the shareholders. If this arrangement was carried out, the shareholders would be free from the liability of any change of trade, or any vicissitudes arising from the business. That in itself was of considerable value, and it must not be overlooked that they had not only tried to obtain as good a dividend and as good terms as they could, but to get the best possible security for the amount the corporation were to pay. They, the shareholders, were to have a primary charge on the whole gas undertaking of the borough, except that which now belonged to the Birmingham Company. The purchase from the other company was on different terms from the purchase from them, the former being for a sum gross. The other company had a capital of £300,000, and the corporation were to pay them the sum of £450,000, which was equivalent to an additional 50 per cent. on their capital; but the corporation were to have the privilege of paying up the amount by giving bonds at the ordinary market rate of 4 per cent. Whilst the shares of the other company would be worth £150, the shares of this company would, on the same principle, be worth £250. The sale to the corporation could only take place with the consent of three-fifths of the shareholders present at a special meeting convened for the purpose of considering the matter, as that meeting had been called. The Birmingham Company had not a similar power to sell to the corporation; but he did not think they would force the contract with the council, if the other company did not agree to sell.

Mr. Marlow: Would a contract with this company be conditional upon a contract with the other company?

Mr. Evans said there would be no such condition.

Mr. Walker perceived that the shares carrying 7½ per cent. had an absolute preference over the others, and the directors were dealing with them upon the same basis as the ordinary shares. Now, he did not think that was just to those who had £28 shares. They were asked to sell the works for corporation bonds and guarantees, which were no better than they themselves held in that company.

Mr. Evans said that Mr. Walker was assuming that the 7½ per cent. shares were in a preferential position. First of all, that position was of no value so long as the company could pay a maximum dividend. If the works were kept in the company's hands there was a probability that at an early period they would have to go to Parliament for further capital, and that Parliament would authorize them to issue that capital at something like the terms they authorized them to issue the last capital, or, perhaps, only 7 per cent.

Mr. Walker said it had not been explained how the old £100 shares were only equal in value to £28 shares. Supposing they were superior, he thought it would be a reasonable thing for the corporation to pay out of their own pocket the remaining £4. The security the corporation proposed to give was not equal to that which the shareholders now held.

Mr. Evans said it was objected to by the corporation, and with some force, that they should pay the maximum dividend on the £4 per share which had not been called up. Some members of the corporation had felt that, as it had not been called up, it was unfair to collect it now. The answer he gave was this, that the shares had been bought or received as an allotment on the supposition that the allottee or purchaser would not only obtain the amount paid up, but have a prospective benefit to all the remaining payments. The point was at once conceded by the mayor. He pointed out that the first thing they had to decide was whether they would sell the works, and at the request of the chairman he read the terms of the resolution which had been prepared by the directors. The resolution was to the effect that the consent of the company be and is hereby given to the sale to the mayor, aldermen, and burgesses of the borough of Birmingham of the undertaking of the company upon the terms already referred to. The motion further provided that the directors be and are hereby authorized to execute all such acts and deeds as in their judgment might be proper and necessary for carrying the sale into effect.

The Chairman moved the resolution just read, which Mr. Wiggin seconded.

Mr. Edwards asked if the corporation had power to redeem the annuities mentioned in the agreement?

Mr. Wiggin: No.

The Chairman said there were two simple facts that struck him. Do what they might on behalf of the company, they could not realize more than 10 per cent. on the old stock and 7½ per cent. on the other. Viewing the whole matter, it was as fair as it possibly could be, and he might state that all the objections he had heard were petty objections. Both the company and the corporation would be benefited by the sale.

Mr. H. Rotton said that suppose they did not sell this company to the corporation, and suppose the other company did sell, they would have the corporation competing with them in the manufacture of gas, and what would become of them?

Mr. Wiggin stated that the directors unanimously recommended the sale.

Mr. Cheshire: Will the directors get any compensation?

The Chairman: We never thought of compensation; we certainly never should ask for it, for it does not belong to us.

The motion was then put and carried, with only three dissentients.

A vote of thanks was then given to the chairman, and the meeting separated.

Birmingham Gaslight and Coke Company.

An Extraordinary Meeting of the Shareholders of the Birmingham Gaslight and Coke Company was held on Tuesday, the 24th inst., at the Queen's Hotel, Stephenson Place, to consider the proposed transfer of the business of the company to the corporation. Mr. J. T. Collins (chairman of the company) presided.

The Chairman said the consideration of the subject which had brought them together was adjourned from the meeting of the company held last week, owing to a technical difficulty which arose. By way of introducing the subject to them, he might mention that so long back as the early part of December last year an inquiry was privately made by the mayor as to whether the company would be willing to sell the undertaking to the corporation, and the general reply was "at a price." This led to further inquiries, and several interviews took place on the matter. It was unnecessary for him to go into details, but he might say that eventually a certain sum was offered for the entire sale of the company to the corporation. That sum of money was such that the directors thought, in justice to the shareholders, they ought to bring the matter before them; and it was a sum which, although they would have been glad if it had

been larger, the directors felt they could recommend to the shareholders as a fair and equitable amount for the sale of the undertaking. He then read the terms which had been agreed upon between the directors and the corporation. The resolution which he should have to submit to them in the first place was as follows:—"That the terms, as read, be and are hereby approved; and that the directors be and are hereby authorized, subject to such limit of time for assent of the said mayor, aldermen, and burgesses as the directors in their discretion shall prescribe, to affix the common seal of the company to an agreement embodying the same terms, with such additions to or variations of detail (not affecting the price) as the directors shall think proper; and that they also be and are hereby authorized to do all such acts and take all such proceedings, including the amendment of the company's bill, now before Parliament, or an application to or support of any other application to Parliament, as they may deem necessary or expedient to complete the transfer of the undertaking." He might say that the sum offered—£450,000—was an advance of 50 per cent. upon the nominal capital of the company, the capital of the company being £300,000; and, taking the market value of the shares at the time the negotiations were being carried on, it was an advance of £90,000 upon the then value of the property. As they were aware, the company had been under a cloud, but they had latterly very greatly improved their works. In addition to that, the bill now before Parliament would occasion a very large increase in the capital. They must, however, bear in mind that there would be the expense of the bill, the cost of the land, and the erection of works thereon. These matters would make a heavy charge on the income of the company for some time to come, and they could not expect a sudden increase in the demand for gas, so as to increase the profits to any great extent for a considerable time to come. The other gas company had a good reserve, whereas theirs was comparatively low. The directors would not have been able to pay the shareholders their full dividend for some time to come. The corporation would give them 5 per cent. until the whole of the purchase-money was paid. How long it would be before the completion of the purchase of course they could not say. Altogether, it would be as good as a dividend of 7½ per cent., whereas the dividend they had hitherto received was 5 per cent. Under all the circumstances, the directors thought the offer one that they could recommend for the acceptance of the shareholders.

Captain BULLOCK seconded the resolution. He said it had been a very anxious time for the directors, and he believed that, looking at the circumstances under which the company had been placed, they had obtained a fair and reasonable price. He did not mean to say they would not have liked more; in fact, they tried to obtain a larger sum than that agreed upon. Bearing in mind the few sales that had taken place of the shares of the company, and looking at other matters, they thought they were only doing their duty in giving the shareholders an opportunity at all events of saying whether they would accept the offer or not.

Mr. BANKS wished to know what arrangements had been made respecting the mode of payment.

Captain BULLOCK: The corporation will give you cash down, or 5 per cent. until they do so.

The CHAIRMAN, in reply to Mr. G. A. Everitt and Mr. Williams, said that the holders of £40 shares would receive £57, and the holders of £80 shares would receive £130. He did not pledge himself positively to these figures.

Mr. TURNER said it appeared to him that the bargain was based on the present value of the property, and in that respect the shareholders were taken at a disadvantage. Five years ago the property was worth a great deal more than at present, and he believed that the day was not far distant when the company would return to the old position. He was not disposed to quarrel or find fault with the barter, for he believed the corporation would manage the affair very well, and consume the gas to the best advantage. He thought, however, that the undertaking was being sold remarkably cheap. He, as a 9 per cent. shareholder, thought it a great hardship that he should have to come down to 7 per cent.

Captain BULLOCK: You will get more than 8 per cent. If the corporation did not purchase the company now, the directors must go to Parliament, but if they did purchase, there was no use in going to Parliament, because they did not want the land. It would be for the corporation to buy additional land.

Mr. TURNER said he desired to have a resolution drawn up with reference to the defalcations which had been committed by servants of the company in the past, giving the company power to sue or prosecute the defaulters.

The CHAIRMAN said Mr. Johnson informed him that there would be no objection against a resolution of the kind being passed.

After further discussion, the resolution was carried unanimously.

Mr. G. A. EVERITT then moved—"That the net purchase-money arising from the sale authorized by the preceding resolution be divided between the holders of the different classes of shares in the company, in the proportion of £57 capital value of each new ordinary share, and £130 capital value of each A and B share—tenth of £150 on each B share."

Captain BULLOCK seconded the resolution, and it was carried *nem. con.*

Mr. TURNER moved—"That it be an instruction to the directors to reserve the necessary powers and funds to prosecute Joseph Harrison and the other defaulters to the company."

Mr. G. A. EVERITT seconded the motion, which was carried unanimously.

A vote of thanks was passed to the chairman, and the proceedings terminated.

CRYSTAL PALACE DISTRICT GAS COMPANY.

The Ordinary Half-Yearly General Meeting was held at the London Tavern, on Thursday, the 26th inst.—ERASMUS WILSON, Esq., F.R.S., in the chair.

The SECRETARY (Mr. Magnus Ohren) having read the notice convening the meeting, the seal was affixed to the register of shareholders, and the following report and statements of account were submitted:—

The directors have to report that the business of the company has been satisfactory during the half year.

The price of coal has been higher than at any previous period; but the directors have not yet found it necessary to increase the price of gas, owing to the satifactory amount obtained for the products.

The allotment of the converted shares has been effected, and they have been distributed *pro raté* among the shareholders.

The reports of the chemical adviser of the company, and of the medical officers of the parishes supplied by the company, on the purity and illuminating power of the gas, continue to be satisfactory. The testing-station erected in conformity with the company's new Act of Parliament is about two miles from the works, and near the central entrance of the Crystal Palace. During the half year, 13 visits have been made to the works and new testing-station (without notice) by Dr. Letheby on the part of the company, and Dr. M'Cormack on behalf of the parish of Lambeth; the average result of these examinations has given an illuminating power of 15 standard sperm candles.

The directors going out of office by rotation are Dr. Frederick Hetley and Dr. Marris Wilson, and, being eligible, these gentlemen offer themselves for re-election.

The auditor going out of office by rotation is Mr. James Glaisher, and this gentleman, being eligible, offers himself for re-election.

The accounts annexed are presented in the form required by the Gas-Works Clauses Act of 1871, incorporated with the Act obtained by the company in 1873. The net profit (account J) added to the sum of £3040, unappropriated profit of the preceding half year, makes the available balance £10,476 3s. 11d. Out of this sum the directors recommend the declaration of a dividend at the rate of 6 per cent. per annum on the preference capital; a dividend at the rate of 7 per cent. per annum on the ordinary 7 per cent. capital; and a dividend at the rate of 10 per cent. per annum on the original capital; all free from income-tax; which will absorb £7428 3s. 4d., and leave £3048 0s. 7d. to be carried forward to the profit of the succeeding half year.

A.—STATEMENT OF SHARE AND LOAN CAPITAL.

Acts of Parliament regulating the Capital of the Company.	Description of Capital.	Maximum Dividend authorized or Interest paid.	Number of Shares issued.	Nominal Amount of Shares.	Called up per Share.	Total paid up.	Amount unpaid or unissued.	Total Amounts authorized.
21 & 22 Vict., cap. 192	Ordinary.	10 per cent.	5,000	£10 0 0	£10 0 0	£50,000	..	£50,000
Ditto ditto	Preference.	6 ditto.	5,000	10 0 0	10 0 0	50,000	..	50,000
Ditto ditto	Loans.	..	..	..	..	5,825	£19,175	25,000
28 Vict., cap. 32	Ordinary.	7 per cent.	10,000	10 0 0	10 0 0	99,271	729	100,000
Ditto ditto	Loans.	..	..	..	..	..	25,000	25,000
36 Vict., cap. 59	Ordinary.	7 per cent.	..	10 0 0	10 0 0	..	150,000	150,000
Ditto ditto	Loans.	..	..	..	..	..	37,500	37,500

B.—STATEMENT OF COALS USED DURING THE HALF YEAR.

Description of Coal.	In Store, June 30, 1873.	Received during Half Year.	Used during Half Year.	In Store, Dec. 31, 1873.
	Tons.	Tons.	Tons.	Tons.
Common	7,806	16,025	15,944	7,887
Cannel	223	271	204	290
Total	8,029	16,296	16,148	8,177

C.—STATEMENT OF RESIDUAL PRODUCTS MADE AND DISPOSED OF DURING THE HALF YEAR.

Description of Residual.		In Store, June 30, 1873.	Made during Half Year.	Used in Manufacture during Half Year.	Sold during Half Year.	In Store, Dec. 31, 1873.
Coke	chaldrons	124	15,699	2,210	11,096	2,517
Breeze	"	..	598	..	598	..
Tar	gallons	10	180,115	..	150,225	29,000
Ammoniacal liquor	"	15,657	161,470	159,450	..	17,677
Sulphate of ammonia	Tons	1	102	..	78½	24½

D.—CONTINGENT-FUND ACCOUNT.

Dr.		*Cr.*	
To Balance, Dec. 31, 1873	£10,367 13 4	By Balance, June 30, 1873	£10,267 13 4
		Revenue account	100 0 0
	£10,367 13 4		£10,367 13 4

E.—RESERVE-FUND ACCOUNT.

To Balance, Dec. 31, 1873	£134 14 0	By Balance, June 30, 1873	..
		Profit and Loss Account, J	£134 14 0
		Interest on amount invested	..
	£134 14 0		£134 14 0

F.—INSURANCE-FUND ACCOUNT.

To Balance, Dec. 31, 1873	£244 11 11	By Balance, June 30, 1873	£154 9 6
		Revenue account	90 2 5
	£244 11 11		£244 11 11

G.—CAPITAL ACCOUNT.

	Expenditure, June 30, 1873.	Expended this Half Year.	Total to Dec. 31, 1873.
To Expenditure to June 30, 1873	£190,065 19 7	..	£190,065 19 7
Since that date—			
Lands acquired	..	..	..
Buildings, manufacturing plant, storeage, and other structures connected with manufacture	..	£318 0 0	
New mains and service-pipes, including laying, paving, and other works connected with distribution	..	£3,336 8 10	
Meters (additional), including fixing, also gas stoves and regulators	..	681 3 6	
			4,335 12 4
Total expenditure	..	..	194,401 11 11
Balance of capital account	..	..	10,694 8 1
			£205,096 0 0

	Certified Receipts to June 30, 1873.	Received during Half Year.	Total Receipts to Dec. 31, 1873.
By Ordinary shares of £10 each	£50,000 0 0	..	£50,000 0 0
Preference shares of £10 each	50,000 0 0	..	50,000 0 0
Ordinary 7 per cent. shares of £10 each	96,382 0 0	2,889 0 0	99,271 0 0
Loans £7,015 0 0			
Less repaid 1,190 0 0			
	..	..	5,825 0 0
			£205,096 0 0

H.—REVENUE ACCOUNT, *for the Half Year ended Dec.* 31, 1873.

Dr. *Cr.*

To Manufacture of gas—		
1. Coals, including all expenses	£23,667 16 11	
2. Purifying materials, wages, &c.	156 13 11	
3. Salaries of engineer and officers	500 0 0	
4. Wages and gratuities	2,170 4 10	
5. Works, machines, and apparatus—repairs, maintenance of, and labour	3,873 3 5	
5A. Retorts, renewal and repairs	500 0 0	
	£30,867 19 1	
Less old material sold	121 3 10	
		£30,746 15 3
Distribution of gas—		
6. Salaries of chief inspector, inspectors, and clerks in light office	528 15 0	
7. Mains and service-pipes, repairs, maintenance, renewal, and labour	930 10 6	
8. Meters, repairing, renewing, and refixing	616 18 0	
		2,076 3 6
Public lamps—		
9. Lighting and repairing		503 11 5
Rents, rates, and taxes—		
10. Rents	12 6 11	
11. Rates and taxes	1,119 4 7	
		1,131 11 6
Management—		
12. Directors allowances	500 0 0	
13. Salaries of secretary, accountant, clerks, and messengers	417 4 0	
14. Collectors commission	298 4 6	
15. Stationery and printing	149 10 10	
16. General establishment charges	745 17 5	
17. Auditors	30 0 0	
		2,140 16 9
Sundries—		
18. Law and parliamentary charges		69 5 2
19. Bad debts		118 5 9
20. Contingent-fund (D)		100 0 0
21. Insurance-fund (F)		90 2 5
Total expenditure		36,976 11 9
Balance carried to profit and loss account (J)		7,660 3 9
		£44,636 15 6

By Sale of gas—		
Michaelmas quarter—		
1. Private rental—		
4,110,600 cubic feet, at 4s.	£822 2 3	
34,310,100 cubic feet, at 4s. 2d.	7,147 18 8	
2. Public rental and under contracts	1,327 2 5	
		9,297 3 4
Christmas quarter—		
3. Private rental—		
5,853,500 cubic feet, at 4s.	£1,170 13 10	
80,977,600 cubic feet, at 4s. 2d.	16,870 6 11	
4. Public rental, and under contracts	1,626 17 9	
		19,667 18 6
5. Meter-rental—the half year		487 14 10
Residual products—		
6. Coke, less labour and cartage	12,429 0 8	
7. Breeze	181 11 6	
8. Tar	1,080 18 3	
9. Sulphate of ammonia and ammoniacal liquor, less labour, &c.	1,123 3 6	
10. Spent oxide	216 2 7	
11. Sundries	138 2 4	
		15,168 18 10
12. Rents		15 0 0
Total receipts		£44,636 15 6

J.—PROFIT AND LOSS ACCOUNT (NET REVENUE), *for the Half Year ended Dec.* 31, 1873.

1. To Amount carried to reserved fund account (E), from profits of half year ending December, 1873		£134 14 0
2. Interest on temporary loans, and moneys received in anticipation of calls		26 12 6
3. Ditto on loans on bonds accrued to Dec. 31		187 4 0
Balance of net profit to be carried to next account, subject to half year's dividends to Dec. 31		10,476 3 11
		£10,824 14 5

1. By Balance of net profit from last account	£10,099 16 5	
Less dividend paid for the half year ended June 30, 1873	7,058 16 5	
		£3,041 0 0
2. Balance brought from revenue account (H), being profit for the half year to Dec., 1873		7,660 3 9
3. Interest on moneys deposited		123 10 8
		£10,824 14 5

K.—GENERAL BALANCE-SHEET, *on Dec.* 31, 1873.

1. To Capital account (G), balance		£10,694 8 1
2. Profit and loss account (J), balance		10,476 3 11
3. Contingent-fund (D), balance		10,367 13 4
4. Reserve-fund (E), balance		134 14 0
5. Insurance-fund (F), balance		244 11 11
6. Unpaid dividends		59 11 11
7. Sundry tradesmen and others, for amount due for coals, stores, &c., to Dec. 31, 1873		15,249 14 9
		£47,226 17 11

1. By Cash at bankers		£1,375 13 8
2. ,, on deposit or at interest		2,045 12 5
3. ,, reserve-fund, invested		134 14 0
By stock of		
4. Coals	£12,308 19 8	
5. Coke and breeze	2,013 12 0	
6. Tar	249 3 4	
7. Sulphate of ammonia and ammoniacal liquor	524 12 5	
8. Sundry stores	4,761 18 7	
		£19,858 6 0
8A. Retort account		638 17 8
By amount due for		
9. Private gas and meter rental	£17,984 7 6	
10. Private arrears uncollected	109 2 2	
11. Public rental and arrears	1,626 17 9	
		19,720 7 5
12. Coke and other residual		1,551 5 8
13. Sundry accounts		1,902 1 1
		£47,226 17 11

The CHAIRMAN, in moving the adoption of the report, said its first paragraph truly represented the real position of the company. The increase in the cost of coal during the last year had been a source of considerable anxiety to the directors, but the satisfactory returns from the sale of residual products had prevented the necessity for an increase in the price of gas. An alteration in this state of affairs was, however, now commencing; coal was diminishing in price, and the value of coke, &c., would be depreciated. What the effect upon the operations of the company during the next six months might be it was difficult to foretell, and he only referred to the matter for the purpose of pointing out that, though at present they were thriving, and in an excellent position, they must not congratulate themselves too much, and suppose that they were entirely out of the wood. There was still a great deal to be done by careful management and economy to maintain the success of the past. It had always been made a point of honour with the board to endeavour as far as possible to keep the price of gas at that which was originally held out to the consumers. They had been able to do so during the pressure upon them of late, and yet to preserve to the shareholders the rate of dividend they were entitled to expect. So far it must be acknowledged that there had been good management, but those who were familiar with the business of the company knew another little fact in connexion with this matter—viz., that they had been in the habit from time to time of reducing the price of gas. In consequence of the circumstances to which he had referred, they had not been able to continue that custom of late, but had been obliged to retain the price at which the increased cost of coal found them—viz., 4s. 2d. Not that that was an extravagant price for a company outside the metropolis, and supplying a district almost rural in its character, and with miles of mains having no consumption on them except from the public lamps. But, when it was found that the company did not require to raise the price of gas, some of their friends, instead of accepting the fact with satisfaction, began to say that no credit was due to them for abstaining, and that it only showed their profits had been hitherto too much. But, as he had already remarked, it had been from the beginning of the company their study to endeavour to reduce the price of gas whenever an opportunity occurred,

because they felt that their success depended upon the consumers, and that it was to their interest not only to give them the best gas which science and skill could provide, but to furnish it at a price which would bear comparison with that supplied in any other locality. The reports of the gas examiners of the parishes within the company's district showed that the purity and illuminating power of their gas continued to be of a high standard of excellence, and in passing he remarked that those shareholders who had not yet seen the new testing-station, near the entrance to the Crystal Palace, would do well to pay it a visit, and satisfy themselves of the admirable means provided by the company for the impartial testing of their gas by the officers of the several parishes, at a distance of two miles from the works. One of the things which had attracted the attention of the directors during the period of the scarcity of coal was that of cooking by gas, and they had introduced into their district stoves for that purpose, so as to induce the consumers to avail themselves of this system. It was sometimes said that if gas was used as extravagantly as cooks were too much in the habit of doing, it would not be an economical process, and no doubt that was the case; but if it were used with the care which it deserved, and only for the time actually needed, it really became a cheap and most excellent provision in the management of a household. In looking over the report it would probably attract attention that an apparently large sum—£3048—was proposed to be carried over to the next account. There was a meaning and an object in this; and the meaning was just that which he had been endeavouring to represent—viz., that though up to the present time the company had been able to fulfil all their obligations and to provide their shareholders with the dividends to which they were entitled, the directors were yet looking forward with some little anxiety to the results of the current half year's working. In this half year they would find a reaction take place which might lead to the necessity of applying a portion of the balance to make up the next dividend. With the aid of this fund they would be able to do so, but the directors would not feel satisfied until they were again in a position to reduce the price of gas to the consumers in their district. With these observations, he moved the adoption of the report.

Mr. LINGING seconded the motion, and, in reply to a shareholder, said that the company had now contracts for coal as low as 15s. 3d., free on board; they had been paying as much as 23s. Their present contracts would last for twelve months. There was, he considered, every prospect of a still further reduction in price, but it must be remembered that, as this took place, the value of coke would be diminished. They could only now get 12s., and it had sold for as much as 26s.

Mr. ROBINSON asked the meaning of the item in the general balance-sheet, "Retort account, £638."

Mr. LINGING said it was a suspense account for the value of the retorts fixed.

The SECRETARY said the company had now adopted the parliamentary form of accounts, in which there was no retort account, and therefore it was placed here as a separate item.

Mr. ROBINSON, referring to the remarks of the chairman as to reducing the price of gas, said he thought they had already bestowed a considerable boon on the public by not raising the price during the extraordinary state of the coal market. He thought they were now entitled to go on for a long time without making a reduction, so as to be able to strengthen their own position. He considered that, with a capital of £200,000, and seeing they had been at work for 15 years, they ought to have a larger contingent-fund than £10,000.

The motion was then put and carried.

Dr. PUCKLE moved, and Mr. HARRIS seconded, the following resolution, which was also adopted:—"That a dividend at the rate of 6 per cent. per annum on the preference capital, a dividend at the rate of 7 per cent. per annum on the ordinary 7 per cent. capital, and a dividend at the rate of 10 per cent. per annum on the original capital, all free from income-tax, be now declared, and be made payable forthwith."

The retiring directors and auditor were severally re-elected, and a cordial vote of thanks was given to the directors for their able management of the affairs of the company.

The CHAIRMAN, in acknowledging the vote, took occasion to speak of the valuable services rendered to the company by their officers, and moved that the thanks of the shareholders be presented to them for the efficient discharge of their respective duties, which was carried unanimously.

Mr. GLAISHER, one of the auditors, acknowledged the vote for himself and for the secretary, engineer, and other officers.

A vote of thanks to the chairman closed the proceedings.

CITY OF LONDON GAS ACT, 1868.

BOARD OF TRADE COMMISSION.

Commissioners—F. S. REILLY, *Esq.*, *Chairman; Professor* ODLING, *F.R.S., and* W. P. PATTISON, *Esq.*

(*Continued from page* 410.)

FRIDAY, MARCH 20.

Mr. *Parkes* was recalled by the COMMISSIONERS, and examined at some length on the form prescribed by him as official auditor for the accounts of the company, the examination being directed to the point raised by Mr. Cripps on the previous day respecting the gross and net income from residuals.

At the close of the examination, Serjeant SARGOOD handed in a table showing the gross estimated and actual receipts for residuals in 1873, and the deductions for wages and cartage, so as to show the net receipts thereon.

Mr. *George Anderson*, examined by Mr. CRIPPS.

I am lessee of the gas-works at Dover, Waterford, Fermanagh, and several other places, and have been engineer to the Cork Gas Company for 18 years. Under Mr. Croll I constructed the Great Central Gas-Works at Bow. I have prepared a table showing what the net price of coal would be for 1874, supposing there were no contract with reference to it in the first instance. I have supposed the company would require 450,000 tons, and I propose that they should purchase 100,000 tons at the high price which ruled in the early part of this year and the latter part of last year—viz., 20s. in the north; then early in February they would have been able to purchase 100,000 tons at a fall of 2s.; and then another 100,000 tons at a still lower price of 16s. at the present time; a little later on they would be able to obtain another 100,000 tons at 14s.; and to make up the 450,000 tons, 50,000 tons more would be required, which I say could be bought for 13s. a ton; giving an average for the year of 17s. 5d. free on board. I should expect to get back 8s. 10d. worth of coke—that is taken at a price of 12s.—and 2·39d. for tar, which is the company's present contract; the breeze I have put at their figure, although I consider it excessively low; the ammoniacal liquor I have also put at their own figure, 2·40d. These items, subtracted from the original price of 17s. 5d., brings out the net cost of coal per ton at 8s. 2·03d. The principle of selling the ammoniacal liquor is in my opinion a bad one. In my own case I manufacture my liquor into ammoniacal salts, because the liquor is a heavy substance that contains a very infinitesimal value in it, and to take that to any place you have to convey 9-10ths of the whole which is worthless, in order to get the 1-10th which is of any value, and therefore it is much more economical to manufacture the liquor on the spot, and not carry away so much dirty water; it would also help to use up some of the breeze. I always take power under Acts of Parliament for that manufacture, and if the Chartered Company have not done so I am surprised; it is as common a clause now in Acts of Parliament as a clause to raise capital. The freight from the Tyne should be from 5s. to 6s., and there would be the dues and lights—about 1s. 3d. or 1s. 4d. more. I think 5s. would be a fair rate to Beckton by steamer; but it would be perhaps a little higher for sailing vessels to other parts, such as Pimlico and Kensal Green. I cannot say what the carriage by rail would be. In my opinion the mode of purification adopted at Beckton is not very economical. At Pimlico it seems to be tolerably economical, because Mr. Brothers gave the price of lime at 4½d. which is only ½d. more than the evidence I gave in the former inquiry; but at the other stations I do not think, from what they tell me, that the purification is so economically conducted, and I attribute that largely to the smallness of the purifiers, and to the mode in which they are worked. At Beckton the lime is not so much worked off as it ought to be; they have not the means of doing it. The result is that great expense is caused by the excessive use of lime, and the labour attendant on the application of that excessive quantity. I also think that too much is thrown on the purifier, and not enough done before the gas goes to it. They have plenty of scrubbers but no washers, and in my opinion, a washer is more essential than a scrubber. In the scrubber the gas only passes alongside the damp surface; in the washer it has to pass right through it, and my experience is that the washer is the most thorough machine. If they were to make more use of their ammoniacal liquor, which itself contains an alkali, and would combine with the acid in the gas, they would get a great deal of impurity removed from the gas which goes to the lime purifiers. The practice of most companies is to put the lime on the tray 3 inches thick. I asked Mr. Trewby the question, and he gave me the same answer. I put the lime on the trays 12 inches thick, and I therefore put about four times as much lime in the purifiers as they do, and the reason I am enabled to do that is because I have my purifiers sufficiently large, so that that extra depth of lime shall not cause an excess of pressure over what the lute of the purifier will stand. Two or three years ago, when the referees were at Beckton, the company found they could not carry out the regulations because they had too much back pressure—that is, that the purifier-lid blew the water out, in consequence of having too much lime. They therefore erected two other purifiers, which had been originally contemplated, and they carry out the process better than they did before. By having your purifiers large, and allowing your gas to pass through slowly, you get the 12 inches of lime as thoroughly saturated as you used to get the 3 inches when using smaller purifiers. I have just erected some large purifiers at Cork, and the last letter that I have from the manager describes the effect of the increase of the layers. He says, "We now only change the large purifiers once a fortnight; the last put out of action passed 7,500,000 feet of gas, and was charged with 200 barrels of lime. At first we had only 21 inches of lime in the purifiers, but I increased this to 38 inches, and found a decided gain, for with the 21 inches we purified 176,000 feet per inch of lime, while with the 38 inches we purified 192,000 feet per inch of lime. I have now increased the lime to 42 inches, but as we have not yet charged them all round with this depth of lime, I am unable to say what the result may be, although I am certain from past experience it will be very satisfactory. The refuse lime from the trays lies 10 inches thick, and is as thoroughly saturated as any I have ever seen. Owing to the manner in which the purifiers are constructed with lime of this thickness we have only 3 inches back pressure; with our old purifiers we had 14 inches and 16 inches pressure. Compared with our former working the saving in lime is also very great; we now do as much with 100 barrels of lime as we did with 150 barrels in the old purifiers." I may also state, in proof of what I say, that if you take a gallon of ammoniacal liquor, as the gas-works make it, without any washing or scrubbing, and if you ascertain by experiment how much foul gas is in it, you will find it to vary exactly with the strength of the liquor. Weak liquor from the hydraulic main will contain about 400 cubic inches of foul gas, containing both sulphuretted hydrogen an carbonic acid, to the gallon; if you increase that up to 11 or 12 ounces you get 3000 inches out of it; if you increase it up to 16 ounces you get 5000 cubic inches as compared with originally only 400. Lime treated in the way in which I treat it is a much less offensive product than when treated differently; it is quite inert when it is partially saturated with carbonic acid, but the moment you expose it to the air it begins to absorb the carbonic acid and the oxygen which it could not get by the purifiers. I make it do to a purifier in a closed vessel, that which, under other circumstances people allow it to do in the open. The time when the lime gives off its most offensive smell, when treated by the London companies, is when it first comes out of the purifiers, although subsequently that goes off to a great extent. The saving of the nuisance from the lime is, in fact, a saving of cost. If the lime is only partially worked off it is so offensive that I have seen men every few minutes have to lean their heads over the vessel to get breath, but when it is worked off in the way I have mentioned they can do their work with perfect ease, there is no nuisance at all. It is our duty not to commit any nuisance if we can help it. I do not believe there is any expense caused by perfect action in any of these matters; the better you do your business the cheaper it is. My opinion is that the time will come when there will be no expense incurred in the purification at all, but there will be a profit. Assuming my process to be adopted, the cost of purifying per 1000 feet will be about, at the outside, three farthings; for the material alone it will be a little more than a halfpenny. I think the company ought to make their own lime, even supposing the breeze was not a drug in the market; but as it is a drug it adds to the desirability of doing it. I have bought no lime for years, and I prefer to make it. I get it all as fresh as can be if there is any care. I can burn up breeze, or indeed any rubbish, throw it into the kiln, and really economize, and it would be due care and management to do that. A few years ago I set about scheming a machine to convert breeze into a form in which it would be of use, and I designed a species of pug machine and sausage machine combined, into which I put the breeze and the tar, and I force it out by a pipe, like in a sausage machine, and it breaks off in small handy pieces for fuel. I never allow a particle of coke to be burnt under my system of boilers, as I saw at Beckton. I do not see the use of making roads with breeze; I would rather burn it and buy gravel. I do not consider these companies exercise due care and management in the sale of their coke. I was manager of one of the London gas-works some time ago, when the Smoke Nuisance Act came out, and whenever I heard of a man being called up before a police magistrate for creating a nuisance, I made it my duty to go to the man and say, "Why do you not burn coke?" And when I happened to be passing a chimney from which smoke was issuing, I used to go to the manager and say, "You are sure to be fined; why don't you burn coke?" The result was that I sold thousands upon thousands of chaldrons of coke, and increased the price 2s. or 3s. a chaldron by doing so. That is proper management, and nothing short of it. With regard to the ammoniacal liquor, I should crystallize it on the works as other companies do, and as I have done for years. There is no nuisance in the manufacture of it. In making my estimate of the quantity of coke in relation to the reduction of the net price of the coal, I have not allowed the same quantity to be used as fuel that the company have claimed, but have taken considerably less. They use about 33 per cent., while I have taken 23, and I do it because, in the first place, several of the London companies do it with less than 23, some as low as 19. I stated at the last examination that the reason they use so much is because their furnaces are so very deep—nearly double the depth of mine—the effect of which is that the man in charge of the furnace puts a great depth of coke into it, and it is impossible for the air going through the furnace to burn that coke properly, because near the bars, where the combustion is perfect, the carbonic acid formed there is, before it gets to the top of the coke, converted into carbonic oxide, and takes up one volume of carbon from the coke without heating the retorts, which atom of carbon is lost; and so long as they use those deep furnaces, they will necessarily use much more coke than they would do if their furnaces were shallower, and the whole of the fuel converted into carbonic acid. I think the Chartered Company, all things considered, certainly ought to do with as little leakage as the Imperial; they have a more compact district; the per centage of

leakage is in proportion to the quantity of gas sent through the mains, and there is no place that I know of so well situate for that as the thickly populated parts of London, where the shops and the warehouses are large; and if the Imperial can do it under 10 per cent., I am sure that in the City and all about the Strand and the thickly populated parts they should do it for even less. We know there is heavy traffic in the City, but there is heavy traffic all over London. I am sure if this company's affairs were in the same condition as the Imperial they would have their leakage quite as low as that.

Mr. CRIPPS: We have heard that all gas not paid for is put down in one lump as leakage. In point of fact, it is not possible, I suppose, to say how much is leakage proper and how much is unaccounted for from other sources—you can only tell correctly the total unaccounted for?

Witness: Yes; but you can form a pretty close estimate of the one and the other. You know that if you measure your gas at 60° at the meter and sell it at the consumer's meter at an average of 45° or 50°, you have a couple of degrees of loss of volume in the reduction of temperature, which would account for 2 per cent. of what is vulgarly called leakage. The gas is more hurried when it leaves the works than when it has travelled some distance, and we have to pump out the water condensed from the gas. That is another element of loss of gas, as you may call it; but the chief loss, so far as I have been able to discover, has always been on the service-pipes, and not generally on the main-pipes nor on the joints. If people would look after it constantly the leakage would be an average quantity from year to year, but it should not be more than 10 per cent. It is the ordinary practice to have meters taken down and examined and painted at intervals. I have considered the quantity of gas made per ton of coal carbonized by the company, and I find at some of the stations it is considerably below what I think it ought to be. I analyzed the make of the gas at each of the stations of the company, from the answers they gave, and at the two stations which the Chartered themselves built—namely, Beckton and Westminster—the make of gas is something like 300 feet less per ton than it is at the other stations which they incorporated by amalgamation. For instance, at Beckton it is about 9300, at Bow Common upwards of 9500, at Westminster a little over 9000 feet per ton. I have made an estimate showing what the available balance of profit in manufacture for 1874 might be and ought to be. I take first the income of the company—the gas-rental, as stated in their own papers, being £785,252. I next take the company's figures for the lighting, £13,000, and for meter-rent, £10,000, which makes £23,000. I take for the residuals 425,816 tons of coal, producing one chaldron of coke per ton, less 23 per cent. for fuel, leaving for sale 327,878 chaldrons. Of cannel coal I find they require 61,016 tons, and I reckon they will require 50 per cent. of that for fuel, which only leaves 30,508 chaldrons, making altogether 358,386 chaldrons, which I take at an average for all the year round at 12s., giving a receipt of £215,031. The breeze, tar, and ammonia, I take at the company's own figures, £82,750, and also rents and sundries at the company's figures, £4000; making a total income of £1,110,033 12s. As regards expenditure, I take coals and cannel at the company's figures, and I do so because they happen to have such a large quantity of coal bought and so little to buy, and that little they have taken at a price very near what I would take it myself, that I have simply taken their own figures for the whole amount, £700,000. The purifying material I take rather less than they—three farthings—which will be more agreeable with Mr. Brothers's evidence than the price stated in the company's sheets, that amounts to £14,353. For salaries and wages, I take the company's own figures, £92,000. Wear and tear, the company's figures, £75,000. Then distribution, wear and tear, £20,000; and salaries, £7500—these are all the company's figures. Meter repairs—here I differ from the company, who have put down meter receipts in their income at £10,000, and meter repairs at £20,000, which is dissimilar from anything I have seen. We always consider we get from the meter-rent as much as keeps them in repair—indeed, some of our best meter-makers offer to keep them in repair for any term of years at 5 per cent. on their original value, so I have taken the meter repairs at the same expense, £10,000, as they put down for meter income; in that respect they and I differ to the extent of £10,000. Public lamps, £13,000; that is their own figure. Rents, rates, and taxes, their own figure, £26,500; that makes £39,500. Then I take the whole of their figures for management, sundries, charges, and annuities, £26,200; depreciation and law expenses, £23,500. The total expenditure therefore is £1,008,053, leaving a balance of £101,983.

Cross-examined by Serjeant SARGOOD: I do not take the annual consumption of the company at 450,000 tons. They say they require about 425,000, and I give them 25,000 more to hold them quite safe, in case they should not get their total quantities.

Serjeant SARGOOD: You have taken it on the calculation that 450,000 tons represent some approximation to a year's business?

Witness: Yes, and a close approximation of what you ought to do. If I had taken it at your actual quantity it would have been a little better for my side of the calculation. I might have taken out the last 50,000 altogether, minus the proportion you use over 400,000; and inasmuch as we are now in the month of March, with coal at 13s., and you have to go on to the end of the year, and coal falling, I could, if I had been hard on you, put that 125,000 tons at the present price of 13s., which would have lowered the average, but I have taken it liberally towards the company. The prices I have mentioned, varying from 20s. to 14s. per ton, do not refer at all to cannel coal, but only to common. I consider 9500 feet of gas per ton a good average. At Dover I make 9400 without any cannel at all, and sometimes 9500. At Beckton they use 6·9 of cannel, and therefore ought to make a little more. The illuminating power at Dover is 14 candles.

Serjeant SARGOOD: Would it make any difference in the quantity if you were compelled to produce 16 candles?

Witness: Oh, yes; it would tend to diminish it.

Serjeant SARGOOD: Taking your estimate as fair for 14 candles, what in your opinion would be a fair estimate for 16 candles?

Witness: I say that, if you require to make 16-candle gas, your 9300 would be perhaps 9200 or 9100; but I must say that, inasmuch as you use 5 or 6 per cent of cannel coal, and only make 9300, I do not think you make enough. I have looked at the company's returns furnished to the Metropolitan Board.

Serjeant SARGOOD: You do not think that the company's method of buying coal is at all consistent with your notion of due care and management?

Witness: I am not going to find much fault with the way in which they bought their coals. They have been unfortunate; but if they had exercised more care they would have got it a little cheaper.

Serjeant SARGOOD: Take West Leversons last October. How could we have exercised more care than we did, when we found that the Imperial were buying them at 2s. or 3s. higher a month or two before, and we waited till October and then made our purchases?

Witness: Assuming that you required to make that purchase at that time, I do not know that you could have done better than you did; but I do not assume that you required them, and that is where the difference lies. I think you bought too many at that time. The price was falling and you were not short of coal. You had, at the end of the year, some 36,000 tons, I think, of common coal. I have looked through these contracts, and I say you have not been so fortunate as the Imperial; that company exercise more intelligence than you have done, for their coal contracts expire about the middle of this year, and they will buy coal cheaper than you will.

Serjeant SARGOOD: If coals had been going up you would have reversed the compliment, and have told the Imperial just the contrary?

Witness: Yes; but it was not likely to do. I think prices are falling still. I do not think it is possible for coals to remain at their present price. The largest contract I have personally made was about 10,000 or 15,000 tons. I have half-a-dozen works, and I do not skip about as the Chartered Company seem to do, but I find out the best coal and stick to it.

Serjeant SARGOOD: You think we do not buy the right coal, and that is an evidence of want of due care, in your judgment?

Witness: Yes, and want of intelligence as well.

Serjeant SARGOOD: Do you not think you can manage to make this admission for me, taking all our stations together, that if we get something above 9350 feet of 16-candle gas, and being compelled to make cannel gas, would not that be an evidence of good management?

Witness: You want a concession that 9350 would be fair, which I am sorry I cannot make. I think you should produce more than that at your common coal stations, and decidedly more at your cannel stations.

Serjeant SARGOOD: You have looked at our profit and loss account, and you have seen we estimate our net profit at £49,552, which you think ought to be £119,000 for this year?

Witness: £101,000, if you deduct the fine of £18,000 which appears in the coke account. In your receipts you do not show that amount as being included.

Serjeant SARGOOD: Notwithstanding it was not stated in words it was a part of the £179,000, the proceeds of coke; therefore we have included it, and yet only make £49,000 odd of profit.

The CHAIRMAN: It appears to us, at this moment, to be included.

Serjeant SARGOOD (to witness): You must attribute to this company, in your judgment, a very great want of due care and management, if your result is the right one?

Witness: Yes; I do say that I could produce from your works the balance I have stated there, and even more. If I had the management I could sell my coke better.

The CHAIRMAN said he thought it would shorten the matter if it came out clearly what were the items in which the witness differed from the company. First of all he added on to the income sheet for coke £35,781, and also for the fine £18,000, which was a total of £53,781 on the coke. Then from the expenditure he took off for purifying £6950, and for meter repairs £10,000, making £16,950. Those two added together made a total of £70,731, which he added to the company's figure of £49,252, and produced his result; so that the only items about which there was any need for discussion with him were those of the coke, the fine, the purifying, and the meter repairs.

Cross-examination resumed: I arrive at the figure by which I put £50,000 on to your expected returns by consuming less coke and selling more than you do. The consumption of the Phœnix Company is 19 per cent. upon their make, and the London Company 21 per cent. I think it is quite fair to draw special comparisons between companies as to residual products without having regard to the aggregate results of their whole trading.

Serjeant SARGOOD: I see in Mr. Field's returns the quantity of coke used for fuel by the London Company is 21 per cent. of the make; then in the next column, under the year 1872, net proceeds of coke, Mr. Field's per centage on the amount of coals comes to 56·8. If I look at the Independent Company I find 41 per cent. consumption, as against the 21 per cent. of the London—very nearly double; while as regards the coke and other residuals, the London is 56·8, and the Independent 54·7—almost upon a par.

Witness: The large residual is the return of tar and ammoniacal liquors, and I can see how the Chartered, who have waterside premises, could get more for those products than the Independent, which is an inland company upon a canal. I think the Chartered Company get about the top price for their tar, so far as I can remember. With regard to purification, all I come here to say is that I could purify your gas much cheaper than you can with your apparatus, and the evidence of Mr. Brothers confirms what I state; although I do not for a moment suppose that Mr. Brothers has the apparatus I consider sufficient for the purification of gas.

Serjeant SARGOOD: Now about meters. What is your theory against our actual experience?

Witness: From the evidence it appears you are going to do something which you have not done before. You found out all at once that your meters were higher than other people's, and that causes you to put down £20,000 for meter expenses when you have only £10,000 for meter-rents.

Serjeant SARGOOD: Can you tell me what possible connexion the expense we incur in looking after the meters has with the rentals we receive?

Witness: If you take down a third of your meters in one year you throw a large expense into that year, and therefore your expenses may be more than if you have been attending to your business continually. I find that the meters I repair are generally balanced by the meter-rents; that is, if 1000 meters produce £1000 rental, you look at the expense of your repairs as the repairs of those 1000 meters, and I find that the expense of repair does not come to so much as the rental.

Serjeant SARGOOD: Did it ever occur to you that there might be a question of repairing meters that did not contribute to the rentals?

Witness: That I should not take into consideration. When the meter belongs to the company, and they receive a rent for it, the usual practice is that the company undertake to keep it in repair; but when the meter belongs to the consumer, and the gas company receive no rent for it, then the consumer keeps his own meter in repair.

Serjeant SARGOOD: Is it within your knowledge that within the limits of the City there are no less than 17,000 meters which the company have to look after, and in reference to which they do not receive one farthing of rental?

Witness: I did not know that. My impression was that you were paid for all your meters.

Serjeant SARGOOD said the 41st section of the Great Central Act of 1851 required a gratuitous supply of service-pipes and meters.

The CHAIRMAN inquired whether the company were to keep those meters in repair?

Witness: The company would do that for their own sakes.

Cross-examination resumed: I am quite aware that when the Great Central Company obtained their Act they contracted to supply meters gratuitously, and to keep them in repair, but I was not aware that was not abrogated by recent Acts. I am also aware that the Great Central Company obtained a price of 4s. for their gas; and, inasmuch as in recent Acts 3s. 9d. was inserted, I thought the 4s. was to cover it.

Dr. ODLING asked what was being actually done at the present time—whether one set of consumers were receiving gas at a less charge than another set?

Mr. WARD said that when the Great Central Company first went into the City that was one of the clauses by which they endeavoured to procure the favour of the public as against the old City of London Company. The Great Central charged no meter-rents, and the City and Chartered Companies were obliged, for obvious reasons, to do the same.

Mr. CRIPPS said it would be necessary to separate those places which paid no meter-rents from those which did pay. That did not appear to have been done, and therefore he had nothing to go upon.

Witness: I do not think it is fair to charge meter-rents in one district and not in another.

In reply to Mr. Pattison, Mr. PHILLIPS said there were something like 60,000 meters in the Chartered Company's district generally, of which number 17,000 were included in the City of London. The whole number were repaired by the company, who received meter-rents for the 43,000 outside the City, but nothing whatever for the 17,000 within the City.

Re-examined by Mr. CRIPPS: In an ordinary way, gas companies supply meters and make a charge for them, generally getting a small profit. The charge in the metropolis is as heavy as in most other places. Up to an amount

of 10 per cent. upon the net cost of the meter, a company may charge what they please.

Mr. CRIPPS: You alluded to two companies, in which the amount of fuel per cent. consumed is less than the quantity which you have given to the Chartered. What effect upon that question can the amount received from other residuals have?

Witness: It can have no effect at all; the other residuals are taken at their own figures, but both ought to burn the same amount of fuel. I consider 23 per cent. of the coke made is as much as ought to be consumed on the works of the Chartered Company. With reference to the net proceeds of coke and other residuals per cent. upon the cost of coal, there is no other company so low as 41 per cent. There are some as high as 61, which is 20 per cent. more; and there are others 58 and 56, which is a further proof of what I say, that the fuel account is too large.

Mr. WARD: The Chartered Company do not produce anything like the coke that the other companies do, because of the illuminating power they give and the quantity of cannel they use.

Re-examination resumed: The returns for 1871 show a worse result than those for 1872. I believe the retorts are better worked at Bow than at the other stations, but I do not know any reason why they should be. At Kensal Green they use 77 per cent. of cannel, and yet they only get 9829 feet. I do not understand that at all, as I have heard many engineers giving evidence of 10,000 feet from a ton of cannel.

By Mr. PATTISON: Reckoning the breeze at 3s., it will cost about 8s. to 9s. a ton when manufactured, and a ton of it will do more work than a ton of coal will, so that it is equal in value at least with coke.

By the CHAIRMAN: I framed the table showing the price of coal if there was no contract, because there was some talk of the contracts having been made at improper times, and I was asked to assume that they had no contract at all, and show what would have been the average cost for the year. I did not measure the furnaces at Beckton. I could see the depth of them with the eye.

Dr. ODLING: It seems to me an extraordinary circumstance that the Phœnix Company should only burn 19 per cent. of the coke produced, and the Independent should burn 41 per cent.

Witness: It is marvellous how to account for it. I could not say how it is in the Independent; I have not known these works for 15 or 20 years. I know in all works where there are stages, and the fire below the stage, the fire is so deep in the furnaces that the men can fill in several sacks of coke at a time. In the Imperial works you could see the volume of carbonic acid that was pouring out of the benches into the retorts. I think the purification might be conducted at a profit eventually, because there will be so little lime required, and it will be so innocuous that it can be burned and used over and over again.

Dr. ODLING: That might, at any rate, materially decrease the cost, but I do not see how you are going to make a profit.

Witness: I refer to the purification altogether from the time the gas leaves the condenser. We know at the present time the oxide of iron people are offering to purify the company's gas for nothing. I am also informed that some persons have offered the company money to do it; consequently there would be a profit. I decidedly object to the opinion that has been expressed that where you have to take out the whole of the ammonia from the gas you must not make the liquor of more than eight or nine ounces. I would not even have liquor of eight ounces. At the termination of my process I would have pure water; at the beginning I should prefer it much stronger. The liquor I should ultimately get out and extract the sulphur from would be 14 or 16 ounces.

Dr. ODLING: Do you see any reason why they should not make sulphate of ammonia at the Beckton station?

Witness: I see a reason why they should, because they would treat their ammoniacal liquor in a different way. They would save the cost of carriage; in fact, the construction of the works should be so as that you would never have to pump the ammoniacal liquor. I have a tank, the bottom of which is raised so high that the body in it gravitates—it deposits itself in that tank. I never use it till it comes out, because it destroys the pumps in no time. My condenser received the encomiums of the gas referees. When I throw one purifier out of gear to empty it, the lime in that purifier is fully carbonated; there is practically no sulphur in it. The next one is partly carbonated and partly sulphuretted. As the gas passes through it does not deposit its own sulphuretted hydrogen; it drives it on to the next.

Dr. ODLING: Ultimately you have them all full of sulphuretted hydrogen. I want to know what becomes of that?

Witness: I should like to ask you that question. I do not know. All I can say is that the gas is free from sulphur. I can only assume that the sulphur takes a solid form. I used to use oxide of iron, but I gave it up.

Dr. ODLING: If all your lime coming out consists mainly of carbonate, I want to know in what form you take your sulphur from the gas. If none goes into the purifier, where does it go to? The sulphur is not a thing you can squeeze into nothing. You drive yours from one purifier to another, and never take it out?

Witness: That is the something that takes place. At Beckton they have oxide of iron purifiers for taking out the sulphuretted hydrogen at the last. I take out the sulphuretted hydrogen without doing so.

Dr. ODLING: I cannot understand your taking out nothing but carbonate of lime, and yet not removing the sulphur.

Witness: The same thing has gone through my mind, that it will get by-and-by into that condition that it will be choke full; but it is not so. The gas is tested, and it would not do to have sulphuretted hydrogen in it.

Mr. *Arthur Silverthorn*, examined by Mr. PHILBRICK.

I am a consulting engineer, in practice in Westminster Chambers, and was for many years assistant to the late Mr. Samuel Hughes. I am engineer to several gas-works abroad. With regard to the increase in consumption which the company anticipate in the sale in 1874 over 1873, I believe the proper rate would be 5·73. I do not found that estimate upon the actual gas sold during the last two preceding years, because I do not think that quite reliable. There have been disturbing influences, and therefore I have gone back towards the former years, and have taken the annual rate of increase. My data is from 1866, and I have taken that data in order that there should be no difficulty in the subject, as it is based upon a return made by the company at the request of a parliamentary committee. The annual rate of increase from 1866 to 1872 was 5 per cent.; but I agree with the view submitted by Mr. Field that the strike made a considerable difference, and that the consumption of gas would have been larger had it not occurred. The consequence is that that modifies the annual rate of increase considerably; and adopting the figure of 3,862,487,000, there is no doubt the whole rate of increase is correctly 5·35 per cent. In the Imperial Company, which has not been subject to those disturbing influences, the rate of increase has been 5·77. The actual figure of the Chartered Company for the last year was a little less than 4·72. I look forward to an increase of 5·73 in 1874 over 1873 with great confidence. If a considerable increase in price is made it would no doubt affect it, but I cannot speculate to what extent. Assuming the price was not substantially raised beyond 4s. 4d., I think the rate of increase would not be affected. Dealing with common gas, the leakage is 14·4 per cent., and with cannel 12·96. I do not think the company go very much beyond the proper amount, but still I think 12 per cent. will be attained from the evidence of the company's officials themselves. I have no doubt a great reduction of leakage would take place if subways were generally introduced. The company is very favourably situated with regard to the City district, which I should say is the richest in the world, except Paris. In 1873 the company carbonized 360,850 tons of Newcastle coal, and the rate carbonized per ton was 9346 feet, and sold 7997; and in respect to cannel gas they carbonized 124,900 tons, and the amount made per ton was 9406 feet, and sold 8187. In my judgment that is not a proper return for the 16-candle gas. I differ with the principle upon which the company carry on their system of using cannel and common coal. It is, of course, necessary to use a certain proportion of cannel to produce 16-candle gas. I disagree entirely with what Mr. Evans said last year that it was more economical not to extract the last 1000 feet from the common coal, but to leave that in on account of the expense of extracting it. I think that the company have pledged themselves to that system of working, and will not retract from it except under considerable pressure; but the results are unfavourable upon the face of it, and we have the proof in the way in which it works out.

Mr. PHILBRICK: Referring to the working of 1873, where we see they use 94 per cent. of Newcastle coal and 6 per cent. of cannel in charging the retorts, upon the average, will you work that out and tell us for 16-candle gas what result you bring out?

Witness: The comparison is in this way. I take 100 tons—the price of coal does not matter so long as I take a high price—6 tons of cannel at 32s. would amount to £9 12s., and 94 tons of common coal at 26s. would be £122 4s.; the total divided by the sale of gas shows that the cost of the raw material—that is the coal—is 39·55d. per 1000 feet. If I reverse the principle, and take 8½ per cent. of cannel coal to 91½ of common, then the result will be that I shall obtain per ton of coal for sale 8825 cubic feet, and the result is that the cost per 1000 feet is 36·05d. There is, therefore, a higher charge of 3½d. incurred in the first process.

Mr. PHILBRICK: Supposing you get your Newcastle coal at 12s. per ton, that will bring it perhaps nearly even?

Witness: I will not say even. At any rate, I find it is much less than 3½d.

Mr. PHILBRICK: What is the ground on which you estimate the 8825 feet to be sold per ton of gas which is made by your second process when you use 8½ per cent. of cannel coal?

Witness: It is not a speculation on my part, it is rather an actual fact; and I have satisfied myself, before adopting that figure, that one of the London companies—the South Metropolitan—has actually worked up to that standard. With regard to the question of the purification, I do not think that I differ at all with the evidence which has been given by the witnesses on behalf of the Chartered Company; they appear to me to have all said that the cost of purification is about 5d. per ton of coal. Mr. Brothers stated that it is under that. I take rather a liberal view, and I think 5d. a ton is the proper cost myself. The mistake that has occurred is this, that the Chartered Company have put down in the estimate an amount of 1·28d., which is, no doubt, considerably in excess of what is actually required, and I have understood, during this inquiry, that this amount includes a great many things which are not only irrelevant to the charge itself, but include a great many other charges which I do not think that item of purifying materials should be saddled with at all. It should be stated at once, for the information of the commissioners, that the cost of purifying is ·70d. or ·80d. per 1000 feet sold upon a proper basis.

Mr. PHILBRICK: Of course, if the 5d. per ton spoken of were applied merely to the cost of the material used for purification, you would not adopt it as distinct from the labour?

Witness: I am not disposed at all to mix up the cost of the wages of the purification with the cost of the material. The question was intended to convey what the cost of purifying materials was, and it turns out that a lot of sundries are included in the company's estimate of that. I think, for the facility of the commissioners inquiry, they should really deal with the question of the cost of material separately. I take that to be 5d., and that is considerably in excess of what the company's engineers say it should be.

Mr. PHILBRICK: With regard to the price of coal—I will not ask you anything about actual contracts—those that we know are made, and we can see for ourselves—but with regard to the quantity that is to be contracted for, what do you say would be a fair price to assume it can be bought at?

Witness: As you put it, I cannot dispute it at all for a moment that they have to deal with the prices that have been contracted for; but, at the same time, in their return it appears to me the company has somewhat confused the prices, and it is very desirable that they should be altered and set out under their proper heads. I do not see the utility of having included Haywood's splint among the cannel coal. I am rather at a loss to see why it was done, unless it is an oversight. I should not like to say there was any intention at all of misleading, but the practical effect is that it reduces the cost of the contracts for common coal, and afterwards the matter is corrected in the estimated expenditure, and they put the cost of the coal there at a much higher rate than they make that figure in this tabular statement. The real cost of the common coal is 27s., and that is the figure that should be substituted for the 26s., which really included only four contracts—New Pelton, then another New Pelton, Londonderry, and West Leversons. The figure of the cannel is 26s. 6d.—that is, for cannel free on board; and the figure for the cannels which are not free on board delivered—that is, Hucknall and Wigan cannel—is 21s. 6d. In either case the cost of freight and carriage to the works would have to be added. As regards the estimate for fuel, I think 33 per cent. of coke is too high; I consider 25 per cent. a proper allowance. The 5·73 per cent. increase upon the company's figure of £383,963 would work out 1d. per 1000 feet, equal to £17,218. In my estimate for 1874 I have estimated the cost of coal at 20s. 6d., and I think it would be unadvisable to take any other figure, because the company will have the whole market to choose from, and I do not think they will run into any disadvantageous contracts. They have the experience of the past to deal with; and I know from the state of the coal market there will be no difficulty in obtaining coal at 20s. 6d. Taking coal and cannel, I estimate the total cost at £505,491, from which will have to be deducted the value of the residuals, £264,804. I should say that the difference between the 25 per cent. and the 33 per cent. for fuel may not be so great as it appears, because the company have, I think unadvisedly, mixed up the two manufactures of common and cannel gas. I have allowed 25 per cent. in the case of the common, and with regard to cannel I should allow 30 per cent. After all the estimate of the company is hypothetical; it mixes up the two gases, and does not enlighten the commissioners as to the special merits of common and cannel gas. It is nothing short of two distinct things. I intended to have put the price of coke much higher than 13s. 6d. per chaldron, but changed my mind on hearing that the company had cancelled the 18s. contract. I have nothing to say against them for cancelling that contract; I have no doubt they did the best they could. I think I have endeavoured to meet the case by putting a lower price; otherwise I should have put it at 15s. As to the other products—tar, ammoniacal liquor, and breeze—I have taken the figures of the company, as there is no doubt they are pretty fairly stated. Including all charges, I think the price of 16-candle gas in 1874 should be 4s. 4·37d., and 20-candle gas 4s. 11·87d., or as near as possible 5s.

Cross-examined by Serjeant SARGOOD: I do not think I have ever before given evidence; I have been called to support documents, and so on, during Mr. Hughes's lifetime. It was quite new to me to hear Mr. Field, I think it was, state, in giving the cost of coal, the price per ton delivered into the retort-houses. Of course, you can carry that principle very far, and you might include stokers charges, and say what it costs into the retorts. The proper course is to take the coal delivered into the works; and, so far as any fresh manipulation is concerned, that properly belongs to the working expenses of the company. I think the Government forms might be decidedly improved.

Serjeant SARGOOD: You say 25 per cent. is a fair per centage for fuel out of

common coke. I am afraid you have overlooked the statement in the book of Mr. Field; there are but a few of the companies which meet your approval?

Witness: As to their working, I differ from you. I think, on the contrary, if we are going into the comparative merits of each company, there are several cases which are shown to be under the estimate. I do not come here to depreciate the company at all.

Serjeant SARGOOD: Have you had any experience of any particular gas-work which enables you to say what is the proper per centage of cannel coke for fuel?

Witness: No; I have had no experience with regard to cannel gas of that description.

Serjeant SARGOOD: Perhaps I may astonish you if I tell you that we, as gas manufacturers, find an experience which indicates that the coke made from cannel is utterly unfit for fuel at all?

Witness: You do not use the cannel coke; you sell it.

Serjeant SARGOOD; You talk of 6 per cent. cannel not being the right quantity —is 8½ per cent. your foreign experience?

Witness: We do not make cannel gas abroad. In no case do I know that the standard abroad has been raised to such an extent as to require cannel coal. The 8½ per cent. is my experience from facts which have come under my observations. I get it from results which I have heard of being carried out at the South Metropolitan Gas-Works; they supply gas of nearly 17 candles, and it was distinctly stated that they used 8 per cent. of cannel. I believe Mr. Livesey stated it, but he is coming forward himself. I made my calculation upon that hypothesis. I gathered the particulars from the printed minutes of evidence.

Serjeant SARGOOD: Let me call your attention to the figures in your way of working it out—6 per cent. would produce out of a given quantity of coal 8700 cubic feet, and you make a calculation that if we had used 8½ we should have obtained 500 feet more. Tell me the nature of that calculation?

Witness: It is grounded on this—I find the South Metropolitan Company were absolutely working at a higher figure than 8825. That is taken from the published accounts of the company. I know that their parliamentary standard of the illuminating power is 14 candles, but it was stated they were making gas considerably higher than that. I do not think the Chartered gas is considerably higher than 16 candles. I have seen evidence that it has been below occasionally —but I have calculated it at 17.

Serjeant SARGOOD: Do you calculate 882,000 feet of your mixture, as against our 800,000 feet, or pretty nearly so, to be exactly the same illuminating power in each case; or are you going to make a mixture to produce a larger number of feet than we do?

Witness: Yes.

Serjeant SARGOGD: Do you take it in this case that the illuminating power is the same?

Witness: Certainly.

Serjeant SARGOOD: I do not like to adopt figures that are suggested to me; but you may be surprised if I tell you that there is a suggestion made to me that, instead of 8½ tons of cannel to make your quantity of feet of the same illuminating power, they would want no less than 20 tons.

Witness: I have nothing at all to say to any evidence of that kind; that is not the question. I have explained why I adopt that view, and I believe others will come and support me.

Serjeant SARGOOD: If I am told by a practical man that it would require at least 20 tons of cannel instead of 8½ to make the quantity you name of the same illuminating power, are you prepared, from your professional experience, to contradict that?

Witness: I am prepared to say that the cannel is not much better than common. I have no doubt that it is the Haywood's splint coal. At Bow Common you use 10 per cent., and you have made 9000 feet.

Serjeant SARGOOD: What I ask you is, are you prepared to contradict that allegation that it would take at least 20 tons instead of 8½ to make the quantity you name of the same illuminating power?

Witness: How can I reply to a question of that description without knowing what kind of cannel it is. There are several sorts of cannel. I do not, however, agree with that statement; and I do not think it is borne out by a single piece of evidence. No doubt 20 tons of inferior cannel will do it if you like to take inferior cannel, but not by taking an average good cannel.

Re-examined by Mr. PHILBRICK: I remember reading that Mr. Livesey said that though his company supplied 14-candle gas theoretically, it was actually 16 candles, to obtain which he used 65,000 tons of common coal and 6000 tons of cannel, which worked out on an average to a little over 8 per cent. I consider that statement corroborates my opinion.

Mr. PHILBRICK: Referring to the answers given by the company, they have classed Haywood's splint coal under the head of common coal; and in another place there is Haywood's gas coal under the head of cannels. Are they two different coals?

Witness: Yes. You will find another head, in which Haywood's splint is classed under cannel coal as well.

Serjeant SARGOOD: Will you show me where Haywood's splint is among the cannel coal? There is Haywood's cannel, which is perfectly different.

Mr. PATTISON: If you turn to last year you will find it.

Serjeant SARGOOD: I remember last year, by mistake, one coal got into the wrong list.

Witness: It is a Scotch cannel.

Serjeant SARGOOD: It is not the same thing which is mentioned as Haywood's cannel and Haywood's gas coal.

Mr. PATTISON said he thought it would have been well if attention had been drawn this year to the change, because last year both Haywood's cannel and Haywood's splint were classified under the head of cannel.

Mr. PHILBRICK said it had been called a bastard cannel by one of the witnesses.

Serjeant SARGOOD said it was called common coal, because it was used for common purposes.

SATURDAY, MARCH 21.

Mr. *George Thomas Livesey*, examined by Mr. GOLDNEY.

I am the engineer and secretary of the South Metropolitan Company, and have been connected with that company for a great many years. My father was manager of it for 30 years. The parliamentary standard of the company is 14-candle gas, but practically we find ourselves obliged to supply gas of a higher illuminating power. We charge 3s. per 1000 feet, and have power to raise the price to 3s. 6d., as also the power of applying for a revision of price. Two years ago, we reduced the price from 3s. 2d. to 3s., and since then we have been paying our maximum dividend, although we have not quite earned it. The works are situated in the Old Kent Road, upon the Surrey Canal. There is no river frontage. We pay 6d. a ton canal dues. We are now building new works; the old works have been added to from time to time. Last year we made 9760 cubic feet of gas per ton of coal carbonized. We sold 9170 per ton, leaving about 6½ per cent. unaccounted for. The proportion of cannel used in the first half of last year was about 5 per cent.. and in the second half not more than 3 per cent. The first half was nearly all Wigan cannel, and in the second half we used over 600 tons of Wigan and 200 tons of Welsh coal—the curly. That, I consider, is a very high standard of cannel. I like it better than the Boghead. It makes a good coke—that is why I like it better. The average illuminating power during last year was 16 candles, which is two candles in excess of what we are obliged to supply by statute. The south part of our district extends to Croydon parish, so that in a large proportion of our district we have a great length of main to supply comparatively few consumers. We do not charge meter-rents, although we have the power to do so. Up to within the last nine months, we have used entirely the oxide of iron system of purification. I consider it the most perfect system, and the most suitable for working; but, by order of the referees last year, we have been compelled to use a certain quantity of lime, although not with very great success. Lately, there has been a considerable alteration in the value of the spent oxide, which is now being used in several manufactories.

Mr. GOLDNEY: As a matter of fact, has it now become more valuable when it leaves the works than when it is brought into them?

Witness: Evidence has been given in this room which I have every confidence in, that oxide of iron can be obtained for purifying purposes for nothing. It fetches as much on being sold for waste material as it costs in the first instance. I believe, if we were allowed to use it, we should ultimately find it a considerable source of profit. Our lime comes by barge or by cart, and costs from 11s. 6d. to 13s. per yard. We cannot sell it again. It is a complete nuisance to us.

Mr. GOLDNEY: What work do you find a yard of lime will do, in your experience?

Witness: I have used lime in conjunction with oxide—one-third lime and two-thirds oxide—so that I am unable to say what work the lime alone will do. I will say this, however—I have very extensive purifiers. They were more than doubled last winter. We could not have done our work had we used lime exclusively. I cannot tell the total cost of purification, as it has been in a transition state. Lime costs about three times as much as oxide. Oxide has cost about 3d., and lime costs us 9d. per ton of coal.

Mr. GOLDNEY: I believe your opinion is that the extracting of sulphur compounds has been carried a little too far?

Witness: That is my opinion. No one is a bit the wiser whether there are 30 grains, or 10 or 12, in 100 feet of gas. We sold coke last year entirely by retail, and I still adhere to that principle. In the first half of last year we received an average price of 18s. 8d. gross and 18s. 3d. net per chaldron for coke, and in the second half we received an average of 19s. 1d. net and 19s. 6d. gross, or 5d. as the cost of loading. We pay the men piecework for filling the sacks, and it is deducted. I had better say 18s. 3d. net and 19s. 1d. net last year, 18s. 8d. being the average. The total cost of manufacturing gas last year was about 2s. 3d. per 1000. This was under ordinary circumstances, and with an increase in the price of coal as against us. I estimate that, owing to the fall in the price of coke, the cost this year will be 2s. 4d. per 1000.

Cross-examined by Serjeant SARGOOD: The average price of coke this year up to the present time has been about 13s.; but I am afraid for the remainder of the year it will not average 11s. If I get 12s. I shall be well satisfied. We are not cannel gas manufacturers.

Serjeant SARGOOD: But you know enough of it to know that what I must call the coke that is produced strictly from cannel coal is not a marketable commodity?

Witness: I know it is a drug. Our restrictions with regard to sulphur are 30 grains—the same at present as those of the Imperial Company. The cost of purification is about 9d. per ton, and we are not reducing the sulphur compounds much below the 30 grains. When the lime is taken out of my purifiers in the condition in which Mr. Anderson exhibited it here, it has done no good whatever in the way of removing sulphur compounds.

Serjeant SARGOOD: Did anything strike you with reference to that when you heard his history about it?

Witness: It struck me it was simply carbonate of lime, and, judging from my experience when the lime comes out in that condition from my purifiers, the sulphur exceeds 30 grains. In that particular I do not accept Mr. Anderson's ideas, but I agree with him fully and thoroughly in all he said as to extending the apparatus.

Serjeant SARGOOD: You say you have doubled your superficial area for this mode of purifying with lime?

Witness: We had up to last November an area of 3200 square feet, and in the beginning of December we added 4000 to it, and that involved a considerable outlay, which required us to find more profit to pay the dividend upon it.

Serjeant SARGOOD: Do you find you made such a saving by that outlay of capital as compensated you for the expense you had been put to in meeting the dividends upon the capital?

Witness: We made a loss. My foreman repeatedly told me that all that we had done was practically of no use, that the introduction of lime had neutralized all the advantages of the larger surface.

Serjeant SARGOOD: You were speaking of the amount of gas unaccounted for, which I dare say you gave advisedly as a figure in your amounts. My friend's question was out of the 9760 feet you made, what was the quantity that you sold, not what you accounted for, because that might take in something that you did not sell?

Witness: What I account for includes 5 million feet that we do not get paid for; the quantity that we actually sell amounts to something like 9100 feet. The odd 70 may be struck off as being unaccounted for, though not sold. We may take 9100 feet as the gas sold, and the remainder is at any rate useless as far as profit goes. We use wet meters, and if consumers require dry meters they have to supply them themselves. We charge no meter-rent. We have a reserve-fund. If we had not possessed it we should have raised the price in the beginning of last year. Our company was formed in 1833 or 1834, and began to make gas in 1834. We are not old enough to have any of our retainers upon the superannuation-fund. Two or three have died who would by this time have come upon it.

Serjeant SARGOOD: Comparing our company with yours, I see that our working expenses in 1872 were 15·81, and yours were 15·57. There you appear to beat us.

Witness: Only about a farthing, you see.

Serjeant SARGOOD: Our other charges are £10,154, in reference to which there is a note that £9520 of this is the superannuations under amalgamation schemes.

Mr. CRIPPS: That would work out considerably less than 1d.

Serjeant SARGOOD: The whole of it works out to 0·70d.; if I take the £9520 it would work out to 0·68d. Now, if I deduct the 0·68d. from your 0·81d., it will be obvious to you at once that we shall come out 15·13d., and that we shall then beat your 15·87.

Witness: That has been urged as the great point in favour of amalgamation, that something might be saved in the working expenses.

Re-examined by Mr. PHILBRICK: The charges for superannuations under the amalgamation schemes are the only charges that under an amalgamation could possibly be added.

Mr. PHILBRICK: And that, of course, if it produces the greater result, not only neutralizes any enonomy of amalgamation, but turns that amalgamation into a positive charge upon the manufacture?

Serjeant SARGOOD: That is argument, and a very fair argument.

Re-examination continued: Our profits were short in the year about £5800 to make up the statutory dividend, and we should have required an addition of 2d. per 1000 feet to enable us to pay the full dividend if we could not have had recourse to the "reserve-fund." It is a question of degree how much ammoniacal liquor it may be desirable to apply to the gas in the washing process. If I use lime as part of the process of purifying, I consider it desirable to get the gas free from carbonic acid before it goes to the lime, so far as it can be made free by washing and scrubbing generally. I go even farther than is ordinarily done in that respect. I am now using ammoniacal liquor to remove carbonic acid, under a patent of Mr. Hills'. The result is better in this way; there being less

carbonic acid to be absorbed by the lime, the lime does not get hard so rapidly and to such an extent as under ordinary circumstances, and the gas passes through more freely. In using lime for purification the process should go on slowly in the lime purifier. The lime which was exhibited to the commissioners on the Imperial inquiry had answered its purpose and was thoroughly exhausted. My practice is to remove the lime before it reaches that condition. We are bound to work with a certain amount of care in purifying, to prevent a nuisance.

By Dr. ODLING: I should think both heavy traffic and sewerage works have great influence upon the question of actual leakage. Where 6 per cent. of cannel is used I should not be satisfied with 9300 feet of gas per ton of coal carbonized. If the Beckton works can get at the rate of 9500 feet per ton of 17-candle gas with 6 per cent. of cannel, they will do very well. When I make gas I prefer getting a larger yield of a low quality and bringing up the quality with cannel if necessary. I believe it is easier to regulate the heats to one uniform high standard than to work at a lower standard. Some of the men would work their retorts too low, and I like the coke better, as it is not so tender, and does not go into breeze to so great an extent. A ton of good Newcastle coal will yield something like 40 bushels of coke. I think the Phœnix Company and the South Metropolitan sell very nearly the same quantity of coke per ton. The D-shaped retorts are used almost exclusively in my own case and by the Imperial. The rule with us all is that we like our retorts to carbonize at least a ton of coal in 24 hours. The Kensal Green works, I believe, have been in a very disorganized state, and therefore they would not work to great advantage, but I certainly should expect, if 50 per cent. of cannel were used, that the make of gas per ton would be something in excess of that of common coal, even if they make 20-candle gas.

Dr. ODLING: Your gas went on into your lime purifiers?

Witness: I adopted a suggestion of the referees. I could not fit up the purifiers for the use of lime exclusively. I put lime in the first layer. The gas comes up through an inlet-pipe, and passes downwards through the material. The top layer is a layer of lime six inches thick, and at the bottom there is oxide.

Dr. ODLING: What are the surface dimensions of your purifiers?

Witness: We have one set with 1400 feet area, another set with 1800 feet area, and another set with 4000 feet area, each set consisting of four vessels.

Dr. ODLING: How do you work them?

Witness: We are obliged to divide our gas, as near as we can, in the proportion of 14, 18, and 40. It is a very difficult matter. The make of gas per day through the last winter was 3,800,000 feet, and that quantity goes through the 12 purifiers, which have a superficial area of 7200 feet.

Dr. ODLING: Upon the whole, you appear to be able to do what the other companies do not do—you charge a low price and send out a high quality of gas, and you pay your statutory dividend. Have you any means of accounting why you should be able to do what other people cannot do?

Witness: It is an awkward question. It may be partly accounted for. I have heard in this room statements made of how the business of the other companies is managed. There are boards of directors, and finance committees, and supervision committees, thus relieving the manager from all personal responsibility. The directors, I am bound to say, act with the purest motives, and they do their utmost for the public and the company, but they do not understand the business as the manager does.

Dr. ODLING: I gather from that that at your works you take a more active part in the contracts and direction than is done by the engineers of larger works, where there is a more imposing board?

Witness: Yes, nodoubtedly that is so.

Dr. ODLING: And, without flattering yourself too much, you think that has a good deal to do with the manner in which you are able to work?

Witness: I take a personal and individual interest, and I feel a personal responsibility. I look at the great iron-works in this country, and I see there that the manager does the work, and if he is not competent they get another manager. They never think of trusting it to boards and committees, I believe.

By Mr. PATTISON: I think there are more than a dozen good gas coals. One company may not call a coal good which another company may consider first rate. I am using coal that some other people will not look at. I have never found any difficulty in getting coal, except during the last few months of 1872. Last year it could have been got all the year through easily. Our practice used to be to make a contract in February each year for the twelve months, but last year I advised the directors to make a contract only from February to August. We bought 20,000 tons in February, free on board in the Tyne, at 20s., less 2½ per cent. In July we bought 25,000 tons at 18s., less 2½; in September, 10,000 tons at 17s., less 2½; in December, 10,000 tons at 15s. net. Last month I arranged for 10,000 tons at 14s., less 2½; and two days ago an agent called upon me and offered me 20,000 tons at 12s. 6d. net. The freight to the Thames was 5s. 9d.; the dues brought it up to 7s. a ton in the Surrey Dock; and putting it into the works would be about another shilling. We charter our own ships. All the coals that have been delivered are the Holmside coal. It is a very fair average coal, equal to the New Pelton, the Londonderry, and the West Leverson, and better than the Wigan gas coal, but perhaps not reckoned quite so good as the Pelton Main. I believe that the market is likely further to fall.

Mr. PATTISON: I see your cost of manufacture was 2s. 3d. per ton in 1872. To what do you attribute that low rate compared with the 2s. 9d. and 3s. of other companies?

Witness: It is a saving in the coal contracts, and also in the diminished loss of unaccounted-for gas, and I think we save to some extent in manufacture. We pay high wages, but we get good workmen.

By Dr. ODLING: By the use of lime we are able to dispense with a certain quantity of cannel coal in getting our ordinary gas up to the standard.

Mr. *Thomas William Keates*, examined by Mr. BIRON.

I am consulting chemist to the Metropolitan Board of Works and to the River Lea Conservancy, and am also superintending gas examiner to the Metropolitan Board of Works. The stations regulated by the City of London Gas Act, 1868, and by the Acts subsequently, are under my authority and control, I think, so far as the use of lime is concerned. The system of purification which Mr. Anderson explained is a very judicious and effective system. An experiment was made some time since in connexion with the City of London Gas-Works as to the effect of scrubbing the gas through Mr. Mann's scrubbers. We take the liquor which passes through the scrubber; the liquor which cleanses the gas is introduced at the upper part, and passes down, and out at the bottom. This liquor was taken in three different parts, at the bottom of the upper 8 feet, at the bottom of the middle 8 feet, and at the lower part of the third 8 feet. The water that goes in at the top was found at the bottom of the first 8 feet to be charged with 11·7 grains of ammonia per gallon, which was close to about ·3 of one ounce liquor. Then the liquor taken at the middle part was 131·6 grains of ammonia per gallon, and that was about one ounce liquor for strength, and at the lower part of the bottom 8 feet the strength of the liquor had risen to 2289 grains of ammonia per gallon and 14-ounce liquor. In the upper 8 feet only 3-10ths per cent. of the ammonia was taken out; then at the bottom of the middle 8 feet 5·3 per cent. of the ammonia was taken out; and at the bottom of the lower 8 feet no less than 94 per cent. of the ammonia was taken out. I had, some time ago, a sample of liquor from the Oxford Gas-Works, where this scrubbing had been carried very far, and in that case the quantity of ammonia was 4743 grains, that being 30 ounces. I received from Mr. Anderson, from his Dover works, a specimen of lime that had been used in the purification of gas, and the analysis is as follows:—Moisture, 24·9 per cent.; carbonate of lime, 63·7 per cent.; sulphate of lime, 1·4 per cent.; sulphide of calcium, 0·8; ammonia, 0·3. The other constituents are unimportant. These results are satisfactory. Then as to the liquor from Mr. Anderson's scrubbers, we have the results per gallon:—Ammonia, 2450 grains; sulphuretted hydrogen, 826 grains, equal to 2275 cubic inches; carbonic acid, 1652 grains, equal to 3493 cubic inches; and sulphuric acid, 126 grains. This shows that the washing process has been very effective. I think the time is very fast approaching when the purification of gas will be looked upon as a source of considerable profit.

Cross-examined by Serjeant SARGOOD: The process of turning the products to profitable account is, I believe, in the hands of a public company. It was originally proposed by Messrs. O'Neill. I consider it has commenced already, and it is one of those things that will increase very rapidly, and therefore the profits will soon be realized. The process does not bear the slightest relation to Anderson's process. It relates to the oxide of iron, and not to the purification by lime.

Dr. ODLING: Do you think it probable that a company which is under the restrictions of the Chartered Company in their works at Beckton and Bow, and therefore obliged to use lime very largely, although oxide is also used to a considerable extent, may obtain during these years a profit from the oxide alone that will cover the entire cost of purification, having regard to the quantity of lime also used?

Witness: I should think not.

Mr. *G. W. Stevenson*, examined by Mr. CRIPPS.

I have heard the evidence that has been given by the Chartered Company in this inquiry. I think they would have exercised a wise foresight if they had limited their engagements for coal, at the very farthest, to Midsummer of the present year. The total quantity of coal required for the current year is stated by the company to be 425,816 tons. If they had limited their contracts to Midsummer they would have required half that quantity, 212,908 tons, at 27s. 8¾d., which works out £295,188; and the other half they would have been able to buy and get into their works at a cost not exceeding 21s. per ton. That would work out at £223,553, making together £518,741, as against £590,500 as contracted for. The saving would have amounted to £71,759—that is exactly 1½d. per 1000 feet on the whole of the gas to be sold for the current year. It is an important element in the success of a gas undertaking that the largest number of feet of gas should be got for every ton of coal. I have compared the working of this company at some of its stations with its working at other stations. I take Bow Common, where the production of gas per ton of coal is 9528 feet, and Blackfriars, where the production is 9402 feet per ton. At Bow Common the per centage of cannel is 10·1, and at Blackfriars 2·5. The average production of those two works per ton of coal is 9465 feet. At Beckton, where the proportion of cannel is 5·1, the production is 9309 feet per ton of coal; and at Westminster, where the cannel is 6·5, the production is 9012 feet. The average of the two stations is 9160 feet. The average quantity of cannel sold in these two stations is 5·8 per cent.—very nearly the same as the other two—but there is a difference of 3½ per cent. per ton of coal in favour of the stations of the incorporated companies against the stations of the Chartered proper. Those stations are all obliged to make the same quality of gas. At Pimlico the production is 9539 feet. It is the best production of any station belonging to the company.

Mr. CRIPPS: Now, supposing the quantity which they show that they produce at Bow Common had been produced at Beckton and Westminster, what would the extra amount produced be, and therefore what would be the saving on the total?

Witness: If the company had produced at Beckton and Westminster an equal quantity of gas to that which they produced at Bow and Blackfriars they would have saved 300 feet per ton of coal, and £3412 a year in coal alone—that is exactly a halfpenny per 1000 feet sold. Then there would be the further saving of wear and tear and labour in manipulating the coal, which would bring the total saving to 0·62 per 1000 feet, or five-eighths of 1d. I have seen the heats at Beckton, and they are not anything like sufficient to extract the proper quantity of gas out of the coal. I think the Chartered Company's district is the most favourable district in the whole world occupied by any gas company for distributing gas with a small amount of unaccounted-for gas. With fair working, the unaccounted-for gas ought not to exceed 10 per cent. At present it is 14·05. If the loss were only 10 per cent. the company would be required to make 4435 million feet instead of 4644 million feet in order to sell the quantity of gas which they expect to sell. The difference is 209 million, which, calculated at 2s. 8·37d. per cent., costs the company £28,190 a year; so that if they work with the 10 per cent. unaccounted-for gas only, instead of 14 per cent., they would save £28,000 a year, which is equal to 1·69d. per 1000 feet.

The following document was then put in evidence:—

Deductions to be made from the Company's Claim of 17·41d. per 1000 Feet of Alleged Deficit.

	Per 1000 Feet.
1. By judicious contracts for coal a saving might have been effected in 1874 equal to	4·31d.
2. By making an equal quantity of gas per ton at Beckton and Westminster with that made at Blackfriars and Bow Common (both being much less than the make of some other companies)	·62
3. By such a revision of the distributory apparatus as would bring down the unaccounted-for gas from 14·05 per cent. to 10 per cent.	1·69
4. By the fine of £18,000 to be paid by Messrs. Lockett and Judkins	1·07
5. By interest amounting to £7500 on debentures raised during 1874, and therefore not chargeable in the present claim	·45
Total deductions	8·15
Deficit claimed	17·41
The true deficit	9·27

Cross-examined by Serjeant SARGOOD: I think you have purchased 100,000 tons of coal more than you prudently ought to be done. The average price of that is £1 7s. 8¾d. per ton. In so far as your purchase extended beyond a period which would terminate with Midsummer of this year, you purchased imprudently. You miss all the summer months, from the 29th of March, 1873, down to the 20th of October, 1873, and then you buy 100,000 tons. The last two contracts into which the company entered, that of the 20th of October, 1873, and that of the 19th of January, 1874, were imprudent so far as the 75,420 tons and the 25,000 tons to be delivered in the current year are concerned, and the 35,000 tons to be delivered in the year 1875.

Serjeant SARGOOD: Taking all round, and making a fair allowance for stations not being all alike, what, on the whole, would be a fair product of gas?

Witness: 9500 feet per ton. I should not say a word against the working of your company if you produced 9500 feet per ton all round.

Serjeant SARGOOD: If the working at Beckton for the last quarter of the last half year turned out 9588 feet per ton, you would not consider that bad?

Witness: No; I should think you were mending your ways.

Serjeant SARGOOD: And if the June quarter were only 9000, that would be somewhat worse than you think it ought to be?

Witness: Yes.

Serjeant SARGOOD: And if the March quarter were only 8970, that would be worse still?

Witness: Yes. If those figures are the facts, you are certainly improving. I do not know what the average per centage of leakage throughout London is. I have heard it stated at 14 per cent., but that was years ago.

By the CHAIRMAN: I think if the company get 1s. 5d., which they are asking for, they will probably not get more than 1 or 1½ per cent. of increase this year; whereas if they get a moderate addition, the increase will be something like a normal increase of 5 or 6 per cent.

By Mr. PATTISON: In Bristol the leakage is under 9 per cent.; in Halifax under 10 per cent., although there is 600 feet difference of altitude in the districts supplied. There are special means adopted there to reduce it. It was brought down from 30 per cent. to less than 10 per cent. by the introduction of street governors, which regulated the pressure. London being districted, they should have a complete revision of the main-pipes and services, and meters. The protection afforded to the pipes by the use of asphalte is very good.

Mr. *Arthur Gunn*, examined by Mr. CRIPPS.

I am accountant to the Metropolitan Board of Works. I have heard the evidence that has been given in this inquiry. The income of the company, as passed by the commissioners, was £1,117,101, to which they added in price of gas £131,174. The income included the balance of 1872 brought forward, £1344, making the income, as estimated, £1,246,931. Then the expenditure, according to the memorandum of the commissioners, was £943,303; but £5000 had been deducted for the defalcation account, making the expenditure £948,303, so that the estimated profit by the commissioners was £298,628. The actual profit, as shown by the account of 1873, as returned by the company in answer to the questions of the Board of Works, is £295,201, showing at first a profit less than estimated by £3427; but in this last year the company have paid £5000 for expense of strike, which was a charge on the year 1872, therefore the profit less than estimated is turned into a profit more than estimated of £1597. I have made a deduction of the amount which the company carried to the defalcation account in 1873, which they did not carry out of the profits available for dividend in the year 1873, inasmuch as they paid their full 10 per cent. dividend. They have carried that to the defalcation account beyond the 10 per cent. which was paid for dividend, and therefore it has come as a full charge on the consumers, and as such has diminished the amount which I should say was properly available for the insurance-fund. In looking through the accounts of the company for the year 1873, I observed that they paid the full 10 per cent. dividend; and that, in addition to that, they carried £5000 to the defalcation account. I then turned to the scheme amalgamating the Chartered and the Great Central Companies, and I found there that it was stipulated that the company should, out of the profits which would have been otherwise available for payment of a dividend of 10 per cent., pay £5000 to the defalcation account, and the sum available to pay that dividend last year.

The CHAIRMAN: We may take it that Mr. Gunn has deducted that £5000 according to his view of what he ought to have done.

Examination continued: As it seems to me there is a profit on the increase of sale of gas in 1874 beyond the company's estimate. The company estimate their increased sale at only 1½ per cent. It appears on the figures to be something like 2·14 per cent. That is owing to the transfer of cannel gas to common in a part of their district; but the increase that they have allowed is only 1½ per cent. I have estimated the increase here for the purpose of this calculation at 5 per cent., and the result of that calculation is a profit of £10,907, which would go to reduce the deficiency of the year 1874.

Mr. CRIPPS: Is that £10,907 the result of the 3½ per cent. that is the difference between your calculation and theirs, or of the whole 5 per cent.?

Witness: The 3½ per cent. I have taken Mr. Stevenson's figures for the cost of coal, the make of gas, and the unaccounted-for gas. The purification is from Mr. Anderson's view of the matter. Then I have excluded the increased produce of coke, whatever it may be estimated to be, and that makes the net deficiency as it seems to me, from which must be deducted the produce of coke beyond the company's estimate of £145,845. Then the company's estimated deficiency is £289,648, which on their estimate of the sale of gas is an increase of 17·41d., and, with the above deductions, I make the deficiency £145,845, and on the increased estimate of the sale of gas—that is 5 per cent. instead of 1½—an increase per 1000 required of 8·5d. But there are other things to be taken into account in dealing with that, that is what amount should be deducted on account of the increased price to be realized from coke. For every £17,000 which there may be, there will be 1d. less required. £18,000 estimate has to come in from coke beyond the figures given by the company, and would reduce the 8·5d. to 7·5d., and then that includes the whole amount that the company propose to carry to the insurance-fund. I do not know whether it will be dealt with in the same way this year as last; if not, of course that amount is reduced.

Mr. CRIPPS: Have you added to that estimate of the cost per 1000 feet the amount which the 1 per cent. would be, carried to the insurance-fund?

Witness: That is included in the gross estimate of the company.

Mr. CRIPPS: What is the total amount that you work out as required, in addition to the 3s. 9d., supposing we started at 3s. 9d.?

Witness: Taking 1d. off from this result of 8·5d. for an increased produce from the sale of coke, the net amount is 7½d.

Mr. CRIPPS: That would be 4s. 4½d.?

Witness: Yes, if all were common; but the cannel will be increased, so that the common will not be increased quite so much as that.

Dr. ODLING: 7½d. all round?

Witness: Yes.

Mr. CRIPPS: In the calculation, the insurance-fund is left in?

Witness: Yes.

Mr. CRIPPS: Will you give us that, supposing the amount of the insurance-fund is estimated separately from the other?

Witness: I have not worked that out, but it will be about 1¾d.

Mr. PHILBRICK: 1·89d.

By Dr. ODLING: The last year in which the company made a profit over 10 per cent. was 1871. I do not think that was the year in which £18,000 was taken from capital to pay dividend. That was the year in which there was an amalgamation with another company. An amount was brought in from that other company and carried to the insurance-fund, and a balance beyond the 10 per cent. dividend and profit was carried over to the following year. The sum carried to the insurance-fund was £14,000 odd, and the interest charged to capital amounted to £18,000, making a difference of £4000.

Mr. PATTISON: Is there any alteration which you desire in the form of the audited accounts?

Witness: I think that to give in the revenue account on the credit side the amount deducted from the return of coke, breeze, tar, and ammoniacal liquor, and to give then the deductions made on account of labour and other charges, would be very useful.

Mr. PATTISON: As giving a clue to the manner in which they effect the sales?

Witness: Quite so. I think also that in the item of public lighting and other contracts on the credit side, it would be useful to give the estimated quantity, which is now given, for the purpose of an inquiry of this kind. By looking into the account one cannot see the total quantity of gas sold. We have the total quantity of common gas sold at 3s. 9d., and of the cannel sold at the higher price, but we have not the quantity sold under lighting and other contracts. I am aware it would only be an estimate; at the same time it would render the account valuable to a person who wished to examine it. At the present moment the quantity of gas sold cannot be abstracted from the account. In the case of the Imperial, where all is common gas, one can easily arrive at the quantity; but here one cannot, because we cannot see how much is for cannel, and how much for common. We have no right, except on occasions when the companies apply for a revision of price, to get information other than what is included in the audited accounts.

MONDAY, MARCH 23.

Mr. CRIPPS addressed the commissioners on behalf of the Metropolitan Board of Works. He said that this, so far as the consumers were concerned, was a very incomplete and insufficient inquiry, owing to the peculiar state of the law. They were asked to decide on a price clearly compounded of two elements, the cost of manufacture and the dividend to be paid on certain capital. In entering into that inquiry, the commissioners were in the present state of the law to exercise their judgment as a judicial body on the due care and management that had been exercised with reference to one of those component parts, while with reference to the other part—of the price—they were precluded from entering into the matter at all. The inquiry was compounded partly of that which required considerable judicial investigation, and of another part, equally important to the consumer, but which resulted in a mere process of arithmetic. The Board of Works in this case disputed both the items, of which the price proposed to be given was compounded. Possibly, in future inquiries the question might relate either to the one or the other of those elements. If it related to the manufacture of gas only, they would always have to be exercising a judicial function; but if it related to the other—how much more was to be required to make up the amount of capital—they would be simply sitting to adjust a mere process of arithmetic. Such, however, was the supposed state of the law. The answer to it was that Parliament had entrusted the whole management of this capital to certain persons, who were directors of this company; they had also entrusted to them the manufacture of gas, and had given them a monopoly of the supply. It was not to be supposed that the consumers could be satisfied with that state of things. It was not a monopoly conducted under ordinary commercial principles of supply and demand, but one in which the first thing the trader had to do was, by Act of Parliament, to get a certain unrisked dividend on his capital. The consumers were unprotected by the law, and they asked the commissioners to look carefully into what was left of the matter to see how they could be protected, and not to be led away by any ordinary statement that it was to be assumed that everything was done right or to be assumed against them. In this case, the commercial success of the company did not depend on their due care and management. So long as they could divide a particular dividend on the whole, they had no motive for carrying on their trade like any other trader. What was the first thing which followed from that state of the law? Why, that the company came avowedly to ask the court to fix a price which would check the consumption of the articles they were dealing in. Where was the matter to stop? The higher the price, the higher would it be every year. The commissioners were asked to fix such a price for gas as should be calculated to give the company a dividend, with due care and management, not exceeding 10 per cent. per annum, and to make up the insurance-fund authorized by the Act. If the commissioners specially appropriated a particular sum of money as the price to be given to the insurance-fund, and that was not done, then the Board of Works would take care that it should be enforced; and if they found there was any want of power to enforce it, it would be better to apply to Parliament for another remedy. Unless the commissioners would allocate those matters separately, the board had no power of raising the question. They could not go to the Court of Chancery last year about this, nor yet to the Queen's Bench, because the sum was not specified. One entire sum was given, and there was no special direction with respect to what should be done with it. He asked the commissioners to put those two sums specially apart—the one for the purpose of making up a 10 per cent. dividend, the other to make up the insurance-fund. Then if in their accounts, at the end of the year, they had touched the insurance-fund for the purpose of making up the dividend, the board would have their remedy; and, if they had not, it would be a strong case to go to Parliament with to obtain a remedy for the future.

The CHAIRMAN: How do you propose that we are to do this?

Mr. CRIPPS said the price which would be sufficient to enable them to pay, with due care and management, the dividend at the rate they were entitled to on their capital should be so much per 1000 cubic feet of gas, and the amount sufficient to enable them to raise the amount which they were entitled to set aside for an insurance-fund should, in addition to that, be so much more, making the total the whole sum of so and so.

The CHAIRMAN said the great difficulty was that they were directed to fix a price *simpliciter*, and then their power stopped.

Mr. CRIPPS said if they fixed the price which, in their opinion, was calculated to do the two things, and gave that price accordingly, it would show clearly on the face of the award how they intended that money to be applied. Passing to the question of due care and management, he said the onus was upon the company to show that they had used "due care and management;" for it was only on the showing of due care and management that they were entitled to ask for any relief. From the beginning to the end of the inquiry no reliable evidence had been produced to show that due care and management had been used in the company's affairs. As Mr. Stevenson stated, in the business of gas manufacture nothing was more important than the time and mode of entering into the contracts; but there was no evidence on that subject either as to who entered into the contracts, or who were the parties who deliberated on them. It was necessary to show that the contracts which were entered upon at a very dear time were necessary. Mr. Cory's evidence was rather against them on the matter. He was asked, "If a party had a very large amount of coal already contracted for he would not go into a dear market to buy more, but wait till a cheaper time? He replied, "The particularly dangerous time for a gas company is probably the three months of December, January, and February. If they have provided for those three months, then there is no occasion to buy at a high price." When the last contract in October was entered into by the company they were already supplied prospectively by contract with 290,000 tons; who, then, was responsible for entering into an unnecessary contract made at a high price? It was all very well to say things might have turned out differently to what they did. Coals were falling at that time. It was not necessary to enter into any contract at all at that price, the company should have held its hand, and the whole of the coals for which they were charging the consumers now, by reason of that contract at that dear period, could have been got at a cheaper price. Who was responsible for that? The local committee was the responsible body, but not one question was asked of the chairman with respect to it, though he (Mr. Cripps) did not say that he could have told anything; he believed he could not. He contended, therefore, that the ordinary commercial activity and enterprise necessary to conduct an affair of this kind successfully did not exist on the part of those who conducted the business of the company. With regard to the sale of coke, he had been a good deal misled in all the earlier parts of the matter by not knowing the way in which those accounts for the coke had been given. He took it for granted that the actual expenditure, more particularly when he saw on the wages table the exact wages paid to the fillers and the foremen had been estimated, and the matters charged on the other side. It was not till he saw Mr. Field's table that his attention was called to a sum of £10,000 struck off coke for the wages. This could not be struck off, because wages were estimated under another head. What ought to be the price of coke? If the contractor was allowed to make an exorbitant profit, so much was taken from the consumers of the gas. He took the general price of coke all the year round at 12s. a chaldron; 12s. 3d. was the price that the Imperial got throughout the year. There were no special circumstances to make the price of this

coke less; in fact, the selling price should be taken at more than 12s. a chaldron, inasmuch as during the early portion of the year the company had received 18s. per chaldron under a contract which had been abrogated. A further sum of £18,000, in the shape of a fine imposed on the contractors, should be added to the receipts from that source, so that the total profits on the sale of residuals would be much higher than what they had been estimated to produce. With reference to the cost of purification, the expenditure under this head had been greatly exaggerated, not only in the present, but in the previous inquiry. If gas companies were unable to come upon the consumers for any deficiency in their revenue, they would be able to exercise far more economy in the cost of purification. According to the evidence of Professor Keats, purification by oxide of iron might be conducted with a profit; but the fact was that no motive for economy existed as long as the companies could rely upon the consumers for their statutory dividends. In dealing with the claims of the company for an increase in their tariff, the great question to be considered was the cost of manufacturing gas. It was proved by Mr. Livesey that gas was made by the South Metropolitan for 2s. 3d. per 1000 last year, and the cost this year would be 2s. 4d. per 1000. It was but reasonable to conclude that, with due care and management, the Chartered Company could make gas as cheaply as the South Metropolitan; in fact, with their new works, they ought to be able to make it a little cheaper. A slight difference would have to be made in favour of the Chartered Company, who were under obligations to supply gas of a higher illuminating power; and in fixing the price which they ought to be permitted to charge, that circumstance should be taken into consideration. As regarded leakage, no evidence had been given to show that the loss from this cause had been reduced to the lowest possible figure. In Mr. Stephenson's opinion, the total unaccounted-for gas ought not to exceed 10 per cent.; and the fact that it was as high in the Chartered Company as 13·2 per cent. was of itself a sufficient proof that due care and management had not been exercised. With regard to the increase in consumption, there was every reason to suppose, unless the company prevailed with the commissioners to put a large and unnecessary price upon the gas for the ensuing year, the increase of consumption would be very considerable—at least equal to what Mr. Beck last year thought it would be, that of an ordinary year, and even in excess of what it had been for some years past. The last question with which he had to deal was that raised through Mr. Gunn, with reference to the amounts which were, as the Board of Works said, improperly spent last year, and which ought to have been carried forward to supplement the dividend this year. By the memorandum, it appeared that the commissioners did not intend last year to allow them to appropriate any increased price given them for the purpose of paying their defalcation account or the stokers' strike, they having to be paid in 1872. He took it as admitted, that they asked improperly, so far as the decision of that tribunal intended, and what was the result of their having done so? Why, that the company had got a larger dividend and the consumers had not got a sum which they ought to have got, because of those two sums being improperly appropriated which ought not now to appear either in one way or the other, but certainly ought to have been carried to the insurance-fund, although it might not ultimately be material to the consumer which of those things were done. Everything taken to fill up the insurance-fund helped to prevent that money being a charge for the future in the price of gas; but they had done neither of those things, and he charged them with it as a matter that they ought to bring forward as an asset applicable to the present year. There were several small points which he might have omitted, but as he was anxious to have sufficient time for the case to be concluded that day, he would offer no further observations.

Mr. *William Haywood*, examined by Mr. GOLDNEY.

I am engineer to the Commissioners of Sewers for the City of London. The subways through the Holborn Viaduct and in Snow Hill, Shoe Lane, St. Andrew's Street, and St. Bride's Street, were constructed under my superintendence. The Chartered have mains in all those subways; nearly the whole of them were laid under my superintendence. I cannot give you any idea of the actual loss by leakage. The pipes in the subways suffer exceedingly little from faults or defects that can cause leakage. The subways are traversed almost daily by my assistants, and directly any smell of gas is noticed information is given to the company; but as a matter of fact the escape of gas is very easily experienced. It must be found out directly in these subways, because every pipe is exposed—they are not buried in the earth; every pipe in the subway is in the open air, so to speak, and in such a position that the joints can be readily got at. I conceive it is almost impossible to have a leakage even of 1 per cent. of the gas that passes through those pipes. The variations of temperature are exceedingly small. I think in the Viaduct subways, which have now been in use for the last four years, and which are better ventilated than subways ordinarily are, the temperature has only on two or three occasions fallen just below freezing point. I have had very little above 60. The pipes do not suffer from contraction and expansion, they are not likely to lose by leakage at the joints, and they are not subject to get that subsidence which does take place in streets where the streets are very much disturbed for repairs and rebuilding of houses; they are not subject to draw from each other, or from other parts of the system.

Cross-examined by Mr. Serjeant SARGOOD: I cannot say that the Commissioners of Sewers are going to build subways all over the City of London for the benefit of the gas companies. I wish we were. I have long held that these subways ought to be constructed everywhere. I dare say the saving of gas will not pay for the subways.

The CHAIRMAN: What is the present arrangement for remunerating the City for the construction of the subways they have made?

Witness: At the present time, neither the gas nor the water companies have paid anything. I may say that both gas and water companies have expressed great objections to the use of subways, but they were forced into them. One objection was that of explosion, and the water companies had said that the gas might get into their pipes.

The CHAIRMAN: Do you think subways may be constructed in what one may call side streets with profit?

Witness: With great advantage to the traffic. The convenience of the subways is principally felt in the main thoroughfares. We have never had any occasion to open the streets in which subways have been laid in the City.

Mr. PHILBRICK then summed up on behalf of the corporation. There were, he said, one or two points to which he wished to direct the attention of the commissioners, as supplementary to the remarks which Mr. Cripps had made. The City consumer, who consumed only common gas, and was not, therefore, interested in the various modifications of the figures by the introduction of the cannel element into the accounts, stood in a somewhat exceptional position. The City district was peculiarly well situated for the supply of gas. It was densely populated, was restricted in area, and although improvements were constantly going on which entailed some disturbance of the soil, yet he could not imagine a gas company desiring a better area for their operations than the City of London. Several companies formerly competed, and the Chartered Company had swallowed them all up. The plea that was urged before Parliament in favour of the amalgamation and of the monopoly which the company now enjoyed was the greater manufacturing capacity, and the bringing to bear, in the interest of the consumers, of all the most modern appliances at works entirely constructed by their engineers, without being fettered with any considerations as to old buildings or any expenditure of capital that might have been deemed useless; but the result of all was that the company which had been in possession of the district which it sought to obtain, which had got into full operation at Beckton, where they had perhaps the largest works in the world, and which represented itself as having exercised due care and management, was now approaching dangerously near to the statute maximum of 5s. 6d. which Parliament had said they should not be allowed to exceed for common gas. He contended that the onus did not lie upon the corporation to satisfy the commissioners that there had been a want of due care and management in the concerns of the company, but it rested rather with those who had got all they asked for, and who were in possession of the works. The corporation appeared before the commissioners in no hostile spirit, and they emphatically disclaimed any intention to make any personal charge against any of the company's officers. No imputation had been made but this—that by the management there had been muddle; that by that which they had done they had placed themselves in such a position that if they were ordinary traders they would not be able to get a return for their investments. If ever a body of traders were bound to use every care and precaution in the manufacture and distribution of the article they sold, it was a company which came clogged with such a weight of unremunerative and unproductive capital as, upon their own showing, the Chartered Company was loaded with. They were supplying 16-candle gas, and were within the limits of the 20 grains of sulphur as prescribed by the referees. They now said that the cost of the manufacture of gas to them was 3s. 8·19d. The South Metropolitan Company, in contrast, were really giving a trifle over 16 candles—having, however, 30 grains of sulphur allowed instead of 20—and were doing for 2s. 3d. or 2s. 4d. that which the Chartered Company now told the commissioners, with all their care, and appliances, and experience, they could not do for less than 3s. 8d. What was the cause of this? Why could they not do as others did? Was it on account of their size, or their having too large a staff, or being hampered by too much red tape? The works at Beckton ought to be the perfection of gas-works; why, then, was no better result obtained there? It could not for a moment be expected that anything reprehensible could be pointed out among honourable gentlemen, such as the directors were, but the result was patent—that the Chartered Company could not do that which other companies could do. In dealing with the present year, he hoped that the commissioners would make it most clearly understood that the company had granted to it an allowance for insurance-fund, which ought to be carried to that fund, so that no improper use might be made of it as one of the items which were to enhance the price of gas to the consumers. With regard to the £7500 on debenture stock, he desired to eliminate that from the account, on the ground that the loan was drawn from the 1st of January. *De facto*, the dividend cost £11,189 more last year than it did before on account of the raising of the capital during that year. It was not a matter that was estimated for by the commissioners. The capital was not then raised. They knew the price of gas they were going to have during the year, and yet they represented this as due care and management. During the year they paid over £140,000 as dividend upon capital that was not raised as capital. If they chose to do that they must do it out of the price they got this year. They could not have it as capital which was entitled to be ranked at the present time, or when the revision commenced on the 1st of January.

The CHAIRMAN: Do you know, as a matter of fact, whether that £11,189 has been paid wholly in dividends, or partly interest on loan capital?

Mr. PHILBRICK said he was told that it was a compound item—partly interest on loan, and partly dividend. The interest on debentures, which was estimated by the commissioners last year, was £28,843. The company paid less—namely, £28,407, but they paid £3573 interest in anticipation of calls in advance, £509 on temporary loans, less interest on money invested; and they paid £258,666 on their ordinary capital as dividend, as against the figure which the commissioners gave them last year, £251,123. The net result of the two sets of figures was £11,189. They also paid out of the profits of the year £5000 upon the defalcation account, and £5024 for the expenses incurred by the stokers strike. That they had a right to make these payments was clear; but that they had a right to make them at the expense of the consumers he totally denied. The company's case was that they were poor in 1873, and should be so also in 1874, not being able to pay their dividend. But why were they in that condition of poverty? Because they paid away a sum which ought to have gone to the insurance-fund, or if not, to the divisible profits. If, therefore, this poverty was the result of their own action, they must not visit it upon the consumer, who paid an increased price to meet the trading expenditure of the company. It was not due care and management to fly in the face of the commissioners award. The company seemed to be exceedingly unfortunate in regard to the matter of coal. The result of the evidence on this point was that this company, going into the market with all the circumstances of cash and credit in its favour, was only able to buy coal in excess of the ordinary market price of the article, and was compelled to take coal for three quarters of the year at an enhanced price, when that which it had to sell—the coke—had to be regulated by the ordinary price of coal in the market. The due care and management had fixed the company irretrievably with a high contract, while they had their coal to sell in a falling market, dependent upon the current price of coal. When the company had got the coal, what did they do with it? In carbonizing it and getting gas from it they did not employ the best process of manufacture, and the consumer could not be satisfied when he found that in consequence of this an increase in the price was sought to be put upon him. Of the gas made it was said that 1 per cent. was consumed at the works. According to their present prices of 4s. 4d. and 5s. 5d., it would amount to over £12,000 a year, and was an exceedingly serious figure.

Serjeant SARGOOD said what the company wasted was at the cost price, not at the selling price.

Mr. PHILBRICK said he did not say it was wasted, but some portion of it was unduly consumed, and that which was thus consumed would produce the amount he had mentioned. The Gaslight and Coke Company, in 1869, was working and selling 8200 feet of gas; the City Company was selling 8900 feet; the Great Central Company was selling 8000 only, the Equitable 8900, and the Western 8400. The Gaslight and Coke Company appeared to have gone down steadily from 1869 to 1872. From the little pressure put upon them last year they appeared to have gone up to 8046 feet, and their estimate now was 8200 feet a ton. He agreed with Mr. Cripps in thinking that there was a little indisposition on the part of the gas engineers thoroughly to adopt the requirements of the referees with regard to purification. As the lime process could not be profitable, but might be a charge upon the working, it would naturally appear desirable to use as little of that process as possible. If lime must be used to remove the sulphur compounds, then the gas should be put into the lime purifiers in such a state that the lime had nothing else to do; but did the purification by lime, as practised by this company, carry out the requirements of a prudent manufacture? Mr. Harris stated that he made 16 million feet, and worked his lime four times; therefore, he purified 4 million feet with each charge. In adopting this process of recharging the purifier four times, he did not seem to get from the lime the full work it ought to do, and in consequence of the hurried mode in which the operation was carried on, not only was the lime offensive, but the gas before it got to the lime was not in that state in which lime could be most beneficially applied to it. The gas did not appear to be passed through any liquor at all. It was merely subjected to the surfaces of the scrubbers; but it would have been expected that as it was to pass through the lime so quickly it would have been thoroughly washed or scrubbed. In conclusion, he said, although it was clear that there must be an increase in the price over the 3s. 9d., still the consumers of London whom he represented would join in thanking the commissioners for the patience they had shown in following out this investigation.

Serjeant SARGOOD said he demurred to the proposition that the onus lay upon the company to show that there had been due care and management in the past. The words "due care and management" related only to the working of the company during the year in which they would profit by the price which the commissioners would fix, and when they brought the experience of the past year as the basis upon which the commissioners were invited to work, the onus was on the other side. The company was not to be called upon to justify itself until some charge was brought against it. The ordinary course was to believe every man to be innocent till he was convicted; and the proper course would be for the commissioners to assume that companies of this description had done their business prudently and providently until the contrary was shown. Then it was said that the engineers of the company did not set their hearts to the work as though they meant to bring out any definite results from it, but it so happened that Mr. Evans was now one of the directors. He had for 20 years been acting as engineer to the company, and was one of the referees who promoted the gas purification question, and was most active in letting the company assist at every experiment to be made to carry it out. In proof of this, it was only necessary to mention that on the 31st of December last a letter was received from the assistant secretary of the Board of Trade, to the following effect:—"Sir,—I am directed by the Board of Trade to inform you that Mr. G. Vernon Harcourt, who has been engaged since his first appointment as a gas referee in making special experiments with the view of ascertaining the best means of eliminating sulphur impurities from gas, has applied to them to be allowed to associate Dr. Siemens with himself for the purpose of conducting certain experiments which appear to be necessary upon a manufacturing scale. As Mr. Vernon Harcourt's inquiry is not included in the ordinary duties of a gas referee as defined in the minute of this department, dated Aug. 29, 1872, a copy of which was sent to you at the time, the Board of Trade are unwilling to add to the expenses which the companies will have to incur in respect of that inquiry. Without consulting them on the subject, and before complying with Mr. Vernon Harcourt's request, they have communicated with Dr. Siemens, and ascertained from him that the expenditure for the additional apparatus and experiments will amount to from £500 to £600. I am therefore to request that you will be good enough to bring this matter under the notice of your directors, and that, after consultation with the other two companies who share with your company the expenses of the gas referees, you will inform the Board of Trade, with as little delay as possible, whether the companies have any objections to offer against the association of Dr. Siemens with Mr. Harcourt for the purpose of these experiments, or to defraying his charge as above stated, in addition to that of Mr. Vernon Harcourt's laboratory experiments." The answer that was sent to this letter contained the following resolution, which was come to by the three companies jointly:—"Resolved, that in the hope that some improved and less expensive method of purifying gas from sulphur compounds than the process now adopted may result, the companies are willing that Dr. Siemens should be associated with Mr. Vernon Harcourt to make the proposed special experiments on a manufacturing scale, and that the expense incurred, at about the amount stated, should be borne by the companies in their respective proportions. The companies, however, suggest that as they have from time to time made very many experiments with the like object, Mr. Harcourt should communicate with them in the first instance, in order that they may give him the benefit of any knowledge they possess, if it should prove that they have already investigated any process similar to that which Mr. Harcourt proposes to enter upon. And the companies submit that, as the proposed special experiments are to be made at their expense, they should be furnished with the particulars of the results obtained; also, that it should be understood that they are to have the free use of any process which those experiments may prove to be of advantage." This clearly proved that the company had done all they could to promote the scientific investigation of the means of purifying gas, and their utmost desire was that the manufacture of the article should be carried out in the cheapest possible manner. For what earthly purpose could they have any desire to needlessly increase their expenses? Mr. Philbrick had referred to the amalgamations, but it should be borne in mind that those amalgamations were caused by the consumers themselves, and yet they were now the first to grumble at the result. The Chartered Company was the first to take upon itself the onus of the experiments at amalgamation, and they were struggling through them as best they could under greatly disadvantageous circumstances, and they could not but complain that the Metropolitan Board of Works and the corporation should now grumble because the amalgamation Acts had not accomplished all that they expected they would. A comparison had been drawn between this company and the South Metropolitan; but Mr. Livesey himself said that nothing could be more futile than comparisons made in this manner between companies where the circumstances were not equal. The comments which had been made on the insurance-fund were founded on a broad fallacy. An insurance-fund was a non-existent thing; it was not something made by the statute. It was simply made by the excess of profits after having paid the statutable dividend, and if there were no such excess, there could be no insurance-fund. With regard to the price of coke, the company calculated that, with the £18,000 fine, they should realize a sum equal to 12s. per chaldron, and that was a fair price. A great deal had been said about coal, which appeared to him like fighting with the air. The charge was that the company had bought too largely, not that they had bought too dearly; but a coal merchant of great experience had told the commissioners that he should have done just as the company had done. It was said that the contract in October was an improvident one, but out of the 100,000 tons only 75,000 were to be delivered in 1874; but six weeks consumption was all they bargained for in the West Leverson district. He did not imagine that the commissioners would jump to the narrow conclusion that, because the market had fallen, therefore there was an absence of due care and management in making that contract last October. The result showed that if they had not bought they might have paid less, but it might have shown that they had to pay more. It was not a necessary consequence that because the price of coal was less now than it was then, therefore they did not display due care and management. They exercised their best judgment, and Mr. Cory, who knew more about these matters than any other person in Europe, said that he should not have considered such a purchase as an indiscreet one. It was nonsense to talk about a large company like this, which had to deal with 2000 tons a day, casting about for small parcels of coal, and picking up little shiploads in the Thames. Then as to the meter repairing, the company had 60,000 meters, and they were making special efforts to minimize the leakage by getting them all into a thorough state of repair. Where such a large number of meters was concerned, it was not extraordinary to find £10,000 attached to the question of repairs. The company got meter-rental for 43,000 meters outside the City of London; but for 17,000 meters inside the City no rent was received; and, therefore, it could not for a moment be said that the £10,000 should be disallowed on the ground that meter-rents equalled meter repairs. The £10,000 was either a real or a fictitious expense. If it was real, the commissioners were bound, in the price, to find a means of meeting it. Mr. Gunn had cleverly prepared a table showing a decrease in the sale of gas by the Chartered Company, and the commissioners were asked to regard them as very bad boys, who had been doing their lessons worse and worse every year of their lives. But Mr. Gunn had entirely forgotten that the company was making 23-candle gas, which the City of London, the Great Central, and the Equitable Companies never did; while, in the second place, the Chartered Company was making 16-candle gas as against the 14-candle gas of the Great Central and the City, and the 12-candle of the Equitable.

Mr. PATTISON: I thought it was in evidence that the quality of gas did not affect the quantity of coal, and, in that very table to which you refer, the Western is 88·47 out of a ton of coal, and that was the highest.

Serjeant SARGOOD: That is the 20-candle cannel gas.

Mr. PATTISON: This deals with all coals.

Serjeant SARGOOD said that was his contention. It was the mixing up of things that were unequal. Mr. Harris had been constantly making experiments to find out the best way of making gas, and he said that a great deal depended upon the coal; and that was evidence far preferable to that of any theorist who said that, no matter what the illuminating power, a company was bound to get the same gas out of a ton of coal.

Mr. PATTISON: I think Mr. Stevenson compared like with like. He showed that at Bow Common, for instance, you made considerably more than at Westminster.

Serjeant SARGOOD said, during all the first quarter of 1873 Beckton suffered greatly from the strike and the inexperience of the men, so much so that the first quarter was only £8500. In their memorandum of last year the commissioners were good enough to state that they had reckoned the dividend the company would pay at £279,966. What they really had had to pay was £290,647, being £10,681 more than the price was put to enable them to pay. The commissioners excluded Higgs's £5000 and the strike £5000, but the company had to pay those sums, and that made another £10,000. Then, again, the commissioners estimated the increase at 7 per cent., but it had turned out to be only 4½ per cent. The difference amounted to 93 million feet of gas, which it was reckoned they would sell, but which they had not sold, and that was £7000 of profit which it was hoped they would get, but which they never did get. The commissioners also knocked off from the estimate of repairs £5000, but the amount was exceeded by £7800, so that there was no less than £32,681 difference between the anticipated and actual results. The meter repairs had cost nearly £8000 over the commissioners estimate, and the increase of taxes and arrears which the company had had to pay amounted to £8700, so that upwards of £50,000 had necessarily to be paid out of the profits of last year, for which avowedly no price was given which was calculated to produce that sum. Was it not idle to make a grievance because the company had not carried into the insurance-fund a sum of money which the corporation chose to think the commissioners had ear-marked for that purpose? Such a sum could not be ear-marked; the thing was from the very circumstances of the case an utter impossibility. He left the case with very great confidence in the hands of the commissioners. He was quite sure it would be well considered. The position of the company was somewhat difficult, considering that they were obliged to come and ask to have their conduct reviewed, and the propriety of their actions judged, long after the period when the circumstances which were inquired into occurred. Were the commissioners prepared to charge the company with want of due care and management because they did not happen to have taken the view which some other persons might have taken under similar circumstances? The commissioners would make all allowances for that fact, and he was satisfied that they would arrive at an equitable result, one that would be a nearer approximation to justice than that of last year.

The proceedings then terminated.

GAS AND WATER WORKS FACILITIES ACT, 1870, AMENDMENT ACT, 1873.

SOUTHPORT (CORPORATION) GAS.

BOARD OF TRADE INQUIRY.

FRIDAY, MARCH 20.

(*Before* G. A. VERNON HARCOURT, *Esq.*)

The Corporation of the Borough of Southport, who are the owners of the gas-works having applied to the Board of Trade for a Provisional Order empowering them to raise the price of gas in Southport and Birkdale 6d. per 1000 cubic feet, and to reduce the illuminating power from 20 to 18 candles, an inquiry into the circumstances was this day opened at the Town Hall.

Mr. COCKIN appeared for the corporation, and Mr. POTTER for the Birkdale Local Board, who opposed the application.

The COMMISSIONER having read the order of his appointment,

Mr. COCKIN opened the case. He said the gas-works had been in existence since 1850. From that date to 1867 they were in the hands of the Improvement Commissioners, and from that year down to the present time in the hands of the corporation. Previous to 1871 the price of gas had been reduced four times, and was now 4s. 6d. per 1000 feet. By the Act of 1865 they were required to supply only 14 candles, but the gas supplied was never less than 20 and generally 22, and no town in the kingdom has such good gas at so low a rate. For some years before 1871, they had supplied Birkdale at the same price, and allowed the local board 6d. per 1000. In 1871 they found that their works were insufficient, and they applied to Parliament for an Act to include Birkdale, and supply that township at the same price as Southport. A company was formed at Birkdale, composed of nearly all the members of the local board, and they applied for a Provisional Order under the Gas and Water Facilities Act, 1870, but the corporation threatened to oppose them, and an arrangement was made between them. Section 10 of the Act of 1871 included Birkdale within the limits of the Act, section 30 fixed the price of gas at 4s. per 1000 cubic feet; by section 35 the quality of the gas was fixed at 20 candles, by section 40 provision was made for testing the quality of the gas in the township, by section 42 provision was made as to the public lamps, and by section 43 it was provided that all mains and pipes should be provided and held by the local board. The corporation were to pay 4½d. per 1000 cubic feet for gas supplied to the township in consideration of the outlay for mains, and 3½d. per 1000 for the privilege of the supply. It could be shown that the interest on the fund sunk by the local board on the gas-mains would be covered by 2d. per 1000 feet on the gas supplied to Birkdale, so that the Local Board of Birkdale had a share in the profits, while they had none of the risks. Since that time the corporation had supplied gas to Birkdale at the price fixed by the Act. The local board, it was true, said that they had tested the gas and found it only 18 candles, but it would be shown by competent evidence that the average quality during 1871-2 was 22 and a decimal candles, and that in 1872-3 it was over 25 candles illuminating power. The increase in the cost of manufacturing had made the present application necessary. It was also contended that even allowing for the increased amount required in the manufacture, the corporation could still carry on the supply without suffering any loss, but it would be shown than cannel and coal had increased so much in price and cost of carriage since the passing of the Act, that it made an increase of 1s. 6d. per 1000 feet in the cost of manufacturing gas. The coke also did not bring so much profit in proportion; coke was going down, whilst cannel kept up in price, and there was also an increase in the cost of fire-bricks and other things, so that there was a loss of 1s. 8d. per 1000 cubic feet upon the sale of gas at the present price.

Mr. *G. W. Stevenson*, examined by Mr. COCKIN, said he considered it a very serious tax upon the corporation to have to pay 8d. per 1000 feet to the Birkdale Local Board. It brought the net price of gas to consumers to 3s. 1½d. per 1000 feet. It was stipulated that two guineas per lamp per year should be paid for lamps in the township, which, upon the calculation that had been made, would be at the rate of 3s. 6d. per 1000 feet. Twenty-eight shillings of this was reckoned for the article, and the remainder for cleaning, extinguishing, &c., while in many Acts he found that 15s. and 16s. was charged for that purpose, so that it left the price of the gas at 3s. 6d. per 1000 cubic feet. There was no parallel case in the kingdom, and no instance, he was prepared to say, in which

20-candle gas was supplied, where only 70 million cubic feet per year was required, at so low a rate as in Southport and Birkdale. Liverpool consumed about 2000 million cubic feet per year; the illuminating power there was 20 candles, and the price 4s. 6d. per 1000. The Chartered Company charged 5s. 5d., and supplied 1000 million feet per year; they were trying to get a higher price, and he was certain they would get it. The Corporation of Southport, in the year ending March 31st, would lose 8½d. per 1000 feet. In the next year he thought they would lose a shilling and a little more per 1000 cubic feet. He attributed the increased cost mainly to the increased cost of coal and cannel. The comparative prices of 1871-2, commencing April 1, 1871, and ending March 31, 1872, were only 22½d., and during the coming year the cost would be 41½d. per 1000 feet more. They had used coal and cannel in the proportion of 75 of the former to 25 of the latter. In the year 1871-2 there was no appreciable difference in the value of coke and other residuals, but in 1872-3 it had considerably increased in price. From April 1. 1871, to June 21, 1872, the corporation received 6s. 8d. per ton for their coke; but the price was raised on the 21st of June, 1872, to 10s. per ton, and that price was retained until September 14, 1872, when it was raised to 15s., continuing at that rate until June 20 of the present year. The present price of coke was 10s. per ton at the new works, which were a couple of miles out of the town, and 15s. at the old works, the difference being accounted for by the carriage from the former place. This price would have to be immediately reduced, as the stocks were accumulating. He gave these figures in order to show that at the present time the value of coke was not greater than from the 1st of April, 1872, to the 31st of March, 1873. He had prepared an estimate of the cost of 20-candle gas for the year ending March 31, 1875, which was based upon the ascertained figures of the year 1872-3. The year 1873-4 was not yet quite complete, and they were compelled to go back to 1872.

Estimated Cost of 20-Candle Gas, for the Year ending March 31, 1875.—Gas to be Sold, 79,937,000 Feet = 7972 Feet per Ton.

Income—	£	Per 1000 Feet.
Gas and meter rental and public lighting	16,239	48·75d.
Residuals	3,464	10·40
Cottage rents	169	·51
	£19,872	59·66d.
Expenditure—	**£**	**Per 1000 Feet.**
10,027 tons of coal and cannel	13,765	41·33d.
Purification and general expenses	2,072	6·22
Repairs	296	·88
Salaries and wages	4,419	13·27
Interest and sinking-fund, £1074 + £2337	3,411	10·24
	£23,963	71·94d.
Deficit	4,091	

71·94d. − 59·66d. = 12·28d. per 1000 feet.

If 18-candle gas be supplied in place of 20-candle gas, the coal and cannel will cost £11,933, and the difference between that sum and the sum stated above—namely, £13,765—is £1832, which is equal to 5·50d. per 1000 feet of gas sold.

The 5·50d. saved by the reduction of illuminating power, and the 6d. increase of price asked for will about make up the estimated deficit.

The deficit was mainly owing to the increased cost of coal and cannel. For the year commencing April 1, 1871, the cost of coal was 22½d. per 1000 feet of gas sold; and the cost was now 41½d., or 18d. per 1000 feet more. They used 80 per cent. of cannel and 20 per cent. of coal. There had been no compensation for the increased cost of coal in the amount received for coke since 1871-2, the year he had quoted. There was no appreciable difference between the value of coke and other residuals then and at the present time. In the year 1872-3 coal and cannel increased considerably in price, but the Southport Corporation had continuing contracts, which enabled them to get coal at the same rate as before. From April 1, 1871, to June 21, 1872 (a period of 15 months) the corporation received 6s. 8d. per ton for coke. The price was raised on June 21, 1872, to 10s., and that price obtained until the 14th of September of the same year, when it was raised to 15s. It continued at that rate until the 20th of January of the present year. The present prices for coke were 10s. at the new works, which were about a couple of miles away, and 15s. at the works in the town, the difference of price being accounted for by the difference of carriage. These prices would immediately have to be reduced, as the stocks were accumulating. He was sure the present price could not be maintained. He based his estimate upon the ascertained figures of the year 1872-3 as to the quantity of gas sold. The year 1873-4 was not yet quite complete, and it was therefore quite impossible to base an estimate for 1874-5 upon that year, because it would be an estimate upon an estimate. He based his estimate upon the year 1872-3, and it must be taken as an approximate estimate. It did not affect his estimate whether the loss was 8d. or 18d., because the corporation was now seeking to be protected from loss during the ensuing year. In the year 1872-3 the corporation made 66,337,000 feet of gas; and the manager of the gas-works assumed that he would sell during the year ending the 31st inst. 21·72 per cent. more than in 1872-3, when the quantity was 79,937,000 feet—7972 feet per ton. It was partly ascertained that the corporation would sell more than that. He saw the station-meter account on the previous day, and could judge of the supply for the few days that remained. The quantity would be in the aggregate about 80,745,000 feet. The largely increased cost that had taken place this year was due almost entirely to the opening of the new works, by which a more abundant supply of gas would be given to the town than it had hitherto obtained. It was not to be supposed that the increase during the ensuing year would be so great as it was last year, but they assumed that it would be 10 per cent., making it 88,819,000 cubic feet. He gave the cost of coal and cannel at £13,765, which was not the real cost of the coal in the works, for the accounts were so kept that cartage was put under the head of general expenditure. That sum was the price contracted for and delivered at the railway station. It ought to be put down as the cost of labour and stacking. He hoped the corporation would alter this anomalous state of their accounts. That worked out to 41·33 per 1000 feet. The amount for purification and general expenses, £2072, was worked out at the same cost as two years ago. The figure for repairs, £296 = 88 per 1000 feet, was the same as two years ago. Salaries and wages, £4419, adding one-sixth for increase of salaries and wages upon the charge of two years ago. These, together, made 10·24 per 1000 feet, instead of 4·23 as last year, so that 6d. was required for that alone. The increase of business was 20 per cent. more. The total expenditure was 71·94d., and the total income 59·66d., thus leaving a deficit of 12·28d. If 18-candle gas were supplied instead of 20, the coal would cost £11,933, and the difference between that sum and the sum of £13,765 was £1832, being equal to 5½d. per 1000 feet of gas sold. These figures were obtained by reckoning 5013 tons of coal at 20s. per ton, 2500 tons of cannel at 38s., and 2500 tons of cannel at 17s. 4d. Calculating upon a saving of 5½d. per 1000 feet on the whole of the gas delivered by the reduction of the illuminating power from 20 to 18 candles, and the 6d. increase in the price per 1000 feet, the deficit would be nearly made up. Their deficit was 12½d. For the year commencing March 31, 1875, the corporation would have remaining under contract 800 tons of cannel at 17s. 4d., and then they would have to buy at current rates any cannel that they would then require. They had enough cannel under the contract to last them until March 31, 1875. They had about 4000 tons of coal in stock, and about 9000 to be delivered, at the contract price of 20s. per ton. If the illuminating power were reduced, by order of the Board of Trade, to 18 candles, they would use that 5013 tons of coal out of the 9000 tons, and would, therefore, have about 4000 tons to be delivered in 1875-6. If the present state of things were continued, the deficit would be what he had stated—nearly 20d. per 1000 feet of gas. The contracts terminated in April, 1876. Speaking upon the general management of the Southport works, in his opinion it was very good. The working expenses were low, the unaccounted-for gas was under 10 per cent., and the sale of gas was at the rate of about 8000 feet per ton; and, generally speaking, the concern was getting on pretty well. The cost of the main-pipes in Birkdale was about £2000; they were probably now worth about £1500. The supply to Birkdale was about 10 million feet, and at 1d. per 1000 feet would realize about £41. The 4½ per cent. interest upon the outlay in Birkdale, assuming the mains to be of the full value as now, would be £85, and 2d. per 1000 feet would pay the interest; so that the Birkdale Local Board actually got 6d. per 1000 feet share in the profits. The 10 millions included everything in supply to Birkdale. He had no doubt they would take more gas if they could have it, but the mains were small. The local board could not make and supply their own gas at anything like so cheap a rate as they got it at Southport, supposing them to stand on an equal footing with Southport. The proper mode would be to supply Birkdale through a station-meter at the confines of the borough, and let the Birkdale Board supply themselves and manage their own pipes; or let the Corporation of Southport buy up the mains and supply the two places. The present arrangement was all for Birkdale, and nothing for Southport. Birkdale stood to win, whether Southport lost or won. It was a very awkward arrangement for Southport, and he thought the corporation would do well to get it altered as soon as possible.

Cross-examined by Mr. POTTER, *witness* said that, in his opinion, the arrangement under the 42nd section of the Improvement Act was a most improvident one for Southport to have entered into. It might have been desirable at the time, in order to prevent the erection of competition works at Birkdale. He should not have advised Southport to enter into such an arrangement. He remembered a parallel case to this of Southport. The people of Rawmarsh had their own main-pipes and gas-works, but these were extinguished, and the place was supplied by the Rotherham Corporation through a station-meter. Rawmarsh then paid a reduced price. He was not surprised that Southport now sought to release itself from the undertaking. He was aware that a company had been formed to supply Birkdale. He was not aware that they had obtained a Provisional Order from the Board of Trade; but if that order had been obtained, it was only so much waste paper if the Southport Corporation opposed it, and it was not confirmed by Parliament. He had seen many Provisional Orders set aside; he had also seen many that were not set aside. He had seen the latest accounts that the corporation had published. The accounts up to March 31, 1873, showed a balance surplus of £3482 16s. 9½d., after placing the sum of £395 to the proportion of general office and other accounts.

By the COMMISSIONER: The estimate was based upon the assumption that the old works would be kept up, and that they would not abandon them until they were worked out, and the new establishment was in full working order. He did not think they would patch up the old works, or put in new retorts. For some little time they would have to keep the two establishments going, and have two sets of men working. That added considerably to the expense, and no doubt the corporation would be advised to abandon the old works as soon as they were used up. It would be very prodigal on the part of the corporation to absolutely throw away the old works, so long as they could be advantageously utilized. The corporation had spent £48,000 upon the new works, with the object of ultimately abandoning the old establishment. When the old works were abandoned, he presumed they would be sold. He thought the capital represented by the old works was about £20,000. That had been reduced from time to time, profits being appropriated in the paying off of mortgage bonds. The capital of £20,000 included mains and meters and other distributory apparatus. The present value of the old works was between £5000 and £8000. He had altogether excluded the value of the cottage property from his calculation. If the property were sold, the proceeds would go in reduction of debentures bearing interest. That would reduce the amount he had allowed for contingency and sinking fund—4½ per cent. on £8000. It would make a little less than 3d. per 1000 feet. That was supposing the corporation got the amount of their valuation of the property. The item of £514 16s. 5d. for carting was very improperly put down. That would be considerably reduced when the new works were developed. He thought it would take the corporation all next year to work out the old establishment. He had made a deduction of rather less than 2d. for the reduced cost of carrying on the new works alone. The discrepancy between Mr. Iddon's (the manager) statement to the Board of Trade and the estimate now given by witness arose in this way—inasmuch as the whole of the cannel was to be received by the 1st of October next, he had excluded that in his estimate of cannel to be used before the 31st of March. Mr. Iddon overlooked that in his statement.

The COMMISSIONER: In proposing to use 18-candle gas, have you taken in that estimate the fact that there would be more coke?

Mr. STEVENSON: The coke would be of a slightly better quality from the coal than the cannel, and there would be some little improvement in the residuals. He had not taken anything for that. They might knock off about ½d. in his calculation for that. They still had a deficit of ¾d.

The court adjourned for a short time, and on the sitting being resumed,

Mr. POTTER (replying to the commissioner) said he rather pressed for an adjournment, because the only figures at the present moment that they had to go upon were really those that appeared in the account for the year ending March 31, 1873. Until that day they had never seen the answers to their objections; therefore, of course, a great deal of the evidence given by Mr. Stevenson, and, he dared say, a great deal given by Mr. Iddon, would be new to them. He thought that, before he proceeded either to cross-examine Mr. Iddon, or open his own case, he should have an opportunity of considering how far the case he had to present to the commissioner should be modified or altered to the new evidence. He thought that was only a matter of fairness. If he examined Mr. Iddon that day, he should probably have to recall him the following day.

After some conversation on the question of adjournment, it was agreed to proceed with the examination of the manager.

The following is the statement of the corporation gas account referred to by Mr. Potter in his last remark:—

GAS DEPARTMENT.

Revenue Account, for the Year 1872-3.

Dr.		*Cr.*	
Coal and cannel	£5,726 0 0	Gas, meter-rents, labour, and lamps	£12,125 10 0
Working expenses and purifying	1,551 0 0	Residual products	2,588 0 0
Repairs	221 0 0	Cottage rents	168 10 0
Salaries and wages	2,828 0 0		
Interest and sinking-fund on old works	*1,074 0 0		
Interest on capital expended on new works			
Profit, balance	†3,482 0 0		
	£14,882 0 0		£14,882 0 0

* Gross profit. † Net profit.

Mr. *Robert Iddon*, examined by Mr. COCKIN, said he had been manager of the Corporation Gas-Works for about four years, and that he had had some experience in the making of gas. The average quality of gas supplied in the financial year 1871-2 was 22·59 candles. The following year the quality was 25·51, and for the present year a little over 20. The result of applying in-

creased pressure, or supplying gas to Birkdale, would be that 50 per cent. more gas would be used. The mains from Southport to Birkdale are too small, and the corporation intend to enlarge them. The result of this 50 per cent. of increase would be that 15 million cubic feet of gas would be used in Birkdale. He was aware of other towns of the same population, and could give the rate of gas and the price. They were as follows:—Belford, 12s. 6d. per 1000 cubic feet; Cricklade, 8s. 6d.; Wooler, 12s. 6d.; Shipstone-on-Stour, 8s. 4d.; Twyford, 8s. 6d.; Shafteabury, 7s. 11d.; St. Neots, 8s. 4d.; and many other places. He did not know what was paid in Ormskirk.

By the COMMISSIONER: The illuminating power in these places was generally about 12 candles.

By Mr. COCKIN: If the Birkdale people manufactured their own gas, they would have to pay at least 10s. per 1000 cubic feet. He was aware of leakages that had been made through the fault of the Birkdale Local Board. They had had leakages since the board began their sewerage works of 7 million cubic feet in two years, which would be of the value of £1373. The amount of gas made in the year 1872-3 was 66,377,000 cubic feet, and the quantity sold would be about 8 per cent. less, or a loss of 5,416,000 cubic feet. Since the establishment of the works, the capital had been reduced at least £20,000. The price paid for cannel used in the year 1872-3 was 17s. 4d. per ton, less 2½ per cent. The present contracts for coal and cannel were—From April 1, 1874, 4500 tons of Wigan coal (Scowcroft and Co.), at 18s. 8d. per ton; 4000 tons of Wigan Coal and Iron Company's coal, at 20s.; 1530 tons of Mostyn cannel, at 28s. per ton; 2513 tons Plaskynaston coal, at 38s. per ton; and 3300 tons of cannel (Wigan Coal and Iron Company), at 17s. 4d. per ton, less 2½ per cent. To make 18-candle gas in 1874-5, they would have to use 5013 tons of coal at 20s. per ton, 2500 tons of cannel at 17s. 4d. per ton, 2513 tons of cannel at 38s. per ton. In 1875-6 they would have to use 5013 tons of coal at 20s. per ton, 800 tons of cannel at 17s. 4d., less 2½ per cent., and to purchase 4213 tons of cannel at 40s. to 50s. per ton, which would use up all the coal and cannel contracted for. The price of coal before the rise began was 12s. 1d. per ton, and cannel was 17s. 4d., less 2½ per cent. discount.

The COMMISSIONER: Your average ought to be higher; your return to the Board of Trade is 12s. 11·8d. for 1871-2.

Examination continued: The price of coke in the financial year 1871-2 was—From April 1, 1871, to June 21, 1872, it was 6s. 8d. per ton; from June 21, 1872, to September 14, 1872, 10s.; and from September 14 to January 20 of this year it was 15s. From that period to the present the price was 15s. per ton at the old works and 10s. per ton at the new. The price of surplus tar in 1872-3 was 20s. per ton; the present price was 29s. 3d. The amount sold in 1872-3 was 200 to 300 tons, and the present year perhaps 300 tons. Iron is double in value; last year it was 6s. 6d. per cwt., this year 12s. 6d. Firebricks last year were 55s. per 1000, now they are 90s. per 1000 or more. We got in 1872-3 for ammoniacal liquor 7s. per ton of 5° strength; the present price is 8s. 7d. per ton. The present condition of the sulphate works is that they are worn out; the corporation intend to erect new works adjacent to the new gasworks.

The COMMISSIONER: Did you make any profit from sulphate of ammonia?

Witness: We shall not receive as much per ton for the ammoniacal liquor as when we made sulphate of ammonia from it.

By Mr. COCKIN: In Shrewsbury they had to supply 12-candle gas at 4s. 8d. per 1000 cubic feet, for gas beyond the borough; St. Helen's, 14-candle gas, 4s. per 1000 cubic feet; Warrington, 16 candles, 4s. per 1000 for a mile beyond the borough, and 6d. extra for a mile beyond that. In the borough it was 3s. 6d. per 1000. In Liverpool it was said that they supplied 20-candle gas, which he doubted, at 4s. 3d. in the borough and Bootle, and 4s. 6d. beyond it. They had reduced their capital by £151,000 premiums on shares sold to the public. At that price they would not receive more than 7 per cent. on their capital, when maximum dividends were paid. The price of labour in 1871-2 was about 16 per cent. less than it was now. The total amount of capital expended up to the present date on the new works was £48,000. They had not paid for the land—but still they had the interest to pay—and he had added £6000 to the £42,000, which would bring it to £48,000. He did not charge any portion of interest in the last published revenue account. The interest had not been taken out of the profits, but they intended doing so this year. They thought it should belong to capital account, and they acted accordingly. The increase in the make of gas for 1873-4 was estimated at 21·72 per cent., and that for the coming year 1874-5 at 10 per cent., and nothing for 1875-6. The old works would be worked only this lighting season, unless they found that they should have to extend the new works at Crowlands, when it might be found more economical to use the old works for a short time again. The effect on the carting account when they got to the new works would be more instead of less. The interest on the additional money to be spent would be more than would be needed for continuing the old works. They intended to put up another gasholder at the new works, and that was contracted for at about £4000. The retort bench would be £1000, and there would be £2000 for extension of mains to Birkdale and other places, making a capital for the year 1874-5 of £55,000.

SATURDAY, MARCH 21.

Mr. *Iddon* was recalled, and stated that the average price of coal for the year 1871-2 was 12s. 11d. 8-10ths, and this he now confirmed. As about 2000 tons of cannel nuts had been used at 9s. 11d. per ton net, instead of 2000 tons of cannel at 17s. 4d. per ton, this would account for the average being 12s. 11d. 8-10ths, instead of from 15s. to 16s. The proportion that had been used in the making of gas was 25 per cent. of coal to 75 per cent. of cannel. In the account for repairs of £220 in the year 1872, he had only £125 charged for repairing retorts. The cost in the year 1874-5 would be at least £350, so that they would have to pay more for repairing retorts than would be obtained in that year extra for gas tar at the price of £1 9s. 3s. per ton as against £1 in the year 1872-3. The reason why they got more for their coke at the old works than at the new was that they sold it at the former in smaller quantities. The new works were outside the town, and not many cottages about. The consumption of gas in the year 1873-4 would be 74 017,000 cubic feet. He had taken about 8 per cent. from the quantity of gas made to allow for loss. Witness handed in the following estimate:—

Revenue Accounts Estimated for the Year 1873-4.
Based on the Actual Revenue Account Year 1872-3

Dr.			*Cr.*		
Coal and cannel	£11,421 0 0		Gas-meter rents and labour, lamps	£14,763 10 0	
Working expenses and purifying	1,884 0 0		Residual products	3,149 0 0	
Repairs	269 0 0		Cottage-rents	168 10 0	
Salaries and wages	4,018 0 0				
Interest and sinking-fund on old works	1,074 0 0				
Interest on capital expended on new works	2,040 0 0		Loss, balance	2,625 0 0	
	£20,706 0 0			£20,706 0 0	

The gas made from March 20, 1873, to March 20, 1874, was 81,680,000 cubic feet. The previous year it was 66,277,000 feet, showing an increase in the make of 15,403,000 cubic feet, or a difference of 23·24 per cent. The amount paid at the works up to the present date was £42,000, and the amount to pay for the land would be about £6600, making a total of £48,000 for the year 1873-4. He reckoned that £5000 would be expended on the new works, and £2600 on the mains for the next year. There would be £4000 for an additional gasholder for the new works, the tender for which had already been accepted. The total amount of the tender was £4225. The addition to the retort bench—they would require 70 retorts—he estimated at a cost of £1000. The £2000 would be expended in main-pipes, one of which would be taken to Birkdale, and the other in the direction of the park. The total amount of capital would then be £55,000 for the new works only. The estimates of 1874-5 were based on £55,000.

Cross-examined by Mr. POTTER: Mr. Stevenson had been through all the matters with him, and had spent some time over them. He accounted for Mr. Stevenson coming to his conclusion, that when he spoke about the coal contracts, it was cannel he was referring to. He gave 17s. 4d. as the average price of coal and cannel for 1872-3. He was prepared to say that when Mr. Stevenson said so he was wrong. The average price in the year 1871-2 would be 12s. 11$\frac{8}{10}$d., and for 1872-3 15s. 3½d. That was for coal and cannel. He could not give the amount of coal that had actually been used during the present financial year. The estimated amount of coal for 1871-2 was 6795 tons, and for 1872-3, 7489 tons. The make of gas in 1871-2 was 62,651,000 cubic feet, and in 1872-3, 66,377,400. The actual increase in the quantity of gas made in 1873-4 was 23·24 per cent., involving a proportionate increase in the consumption of coal. Taking the average of 1872-3 at 71·35, he would get an increased consumption of coal of 9115 tons. The estimates of coal and cannel required for the next three years, in addition to that already in stock, were as follows:—

Cannel and Coal to Receive under Contracts at April 1, 1874.

Contracted for 1873.						
5,000 ..	4,500 tons of coal from Scowcroft and Co.	at 18s. 8d. p. ton.				
4,500 ..	4,000	,,	,, Wigan Coal & Iron Co. at	20	0	,,
4,000 ..	1,530	,,	Mostyn cannel. at	28	0	,,
3,000 ..	2,513	,,	Plaskynaston cannel. at	38	0	,,
5,500 Aug 19	3,300	,,	Wigan cannel. at	17	0	,, less 2½ p. c.
22,000 tons	15,843	,,	Total to receive on April 1, 1874.			

Required for 1874-75.—18-*Candle Gas.*

5,013 tons of coal.		
2,500	,,	Wigan cannel.
2,513	,,	Plaskynaston cannel.

Required for 1875-76.—18-*Candle Gas.*

5,013 tons of coal.		
800	,,	Wigan cannel at 17s. 4d. per ton, less 2½ discount.
4,213	,,	Wigan cannel at from 40s. to 50s. per ton.
20,052	,,	coal required in the two years 1874-75, 1875-76.

4,213 tons of cannel to purchase at 40s. to 50s. per ton.		
4	,,	coal to receive on April 1, 1876.

The estimated cost of 18-candle gas for the year ending March 31, 1876, was as follows:—

Gas to be Sold as in the Year ending March 31, 1875—79,037,000 *Cubic Feet* = 7972 *Feet per Ton.*

Income—			£		d.
Gas and meter rents, and public lighting			16,239	..	48·75
Residuals			3,464	..	10·40
Cottage-rents			169	..	0·51
			£19,872	..	59·66
Expenditure—					
5,013 tons of coal at 20s. 0d. / 800 do. cannel at 16 11 / 4,214 do. do. at 45 0	10,027 tons of coal and cannel	£15,190	..	£1 9 3 (per ton)	45·60
Purification and general expenses		2,072	..	—	.. 6·22
Repairs		296	..	—	.. 0·88
Salaries and wages		4,419	..	—	.. 13·27
Interest and sinking-fund, £1074 and £2337		3,411	..	—	.. 10·24
		25,388	..		79·21
	Deficit.	£5,516			

79·21 — 59·66 = 19·55d. loss per 1000 cubic feet of gas sold in 1875-6.

It was about 2½ miles from Southport to the new works. They had never tried to increase their prices by bringing the coke from the new to the old gasworks. The cartage would be more. It was an inferior coke. The average weight of coke produced from each ton of coal was about 11 cwt. The proportion of tar per ton of coal used was from 10 to 12 gallons, and of ammoniacal liquor about 10 gallons. He had given an estimate of £2600 as the loss on the increased consumption of gas this year. They had a storeage of 330,000 feet at the new works, and 120,000 cubic feet at the old works, which was not sufficient for their present purpose. They would remove to the new works after the present season was over. He himself tested the illuminating power of the gas, and sent it to the committee. He also made a note of it in a book he had for that purpose. On the 7th of April it was 28 candles, and on the 8th, 30 candles. The average for the year was 28 candles. The lowest was above 20 candles, and the highest 31 candles; that was on the 31st of March, 1873. The gas was tested at an inch of pressure. The minimum pressure of gas in Birkdale was about 8-10ths. The yield of gas this year would be 8857 cubic feet.

By the COMMISSIONER: He estimated the leakage in 1873-74 at about 8 per cent. The reason why the price of coke would be reduced was because they had a very large stock at present, and they would have to lower the price to dispose of it. The working, as at present, made a difference of £200 or £300 per annum. The average illuminating power of the gas at the present time was very little over 20 candles. It was considerably less than it had been in the previous years, the cannel being worse than formerly, although it came from the same mine. The average quantity of gas supplied to Birkdale up to Dec. 31, 1873, was about 10 million feet. It had not been a very increasing supply, and this was owing to the mains in Birkdale not being large enough. He thought they might supply 50 per cent. more if there were larger mains. The chief increase was in the Southport consumption. He expected that the consumption would be increased when new mains were put down from Southport to Birkdale, which would be done at the expense of the corporation. The diameter of the principal mains was 6 inches, but there was a small length of 12 inches. It was his business to make an estimated value of the works each year. The capital put down for the old works, including mains, service-pipes, meters, and other apparatus, appeared to be £24,892; but that amount was reduced, in consequence of the depreciation of stock, by £3800. He could not give an estimate of what the old works would sell for.

Mr. COCKIN explained that they could not sell the site for houses, but only for business purposes.

The COMMISSIONER: There was something brought forward yesterday about the leakage at Birkdale in consequence of the sewerage works, and it sounded as of a very large proportion.

Witness, in reply, stated that it was a large proportion. Owing to the very large increase in the consumption, he had estimated that they would require all the retorts they had put in the new works. He thought that by next winter they could do without the old works. He should have 21 or 28 retorts to spare in case of an accident.

Mr. *P. J. Whitehead*, an accountant, was called, and stated that the surplus in the accounts of the gas department went to the reduction of the rates in

Southport, but none of it went to the reduction of the capital account. There had been no reduction for the last seven years. The surplus had been to the amount of 22 or 23 per cent. Not a penny of it went to the reduction of the gas account. Previous to the Southport Improvement Act, 1871, they set aside 2½ per cent. of the amount, but since the new Act they only set aside 1-70th per cent. The capital had been largely increased. The total salaries would be about one-third of the entire corporate account.

Mr. SHAWCROSS rose to make an application on behalf of some of the Southport ratepayers, observing that 8-10ths of them were against the action of the corporation; but the commissioner stated that he could not listen to him, as no notice had been given to the Board of Trade.

Mr. POTTER then addressed the commissioner on behalf of the Birkdale Local Board, and said he proposed to show that no loss could be attributed to the supply of gas to Birkdale. The Corporation of Southport supplied gas under a provision of their Improvement Act, 1871. At that time a company was being formed to supply Birkdale with gas, and the corporation came forward and said they would do it. He called the commissioner's attention to clauses 28 to 50, both inclusive, of the Act of 1871, which related to the gas question. The price of gas was limited by clause 30, which states that "the corporation shall not demand or receive for the supply of gas by meter any sum exceeding 4s. per 1000 cubic feet of such gas," &c. The illuminating power was provided for by clause 35, which stated that "all the gas supplied by the corporation shall be of such illuminating power as to produce from an Argand burner, having 15 holes and a 7-inch chimney, or other approved burner and chimney or burners consuming five cubic feet of gas per hour, a light equal in intensity to the light produced by 20 sperm candles of six in the pound, burning 120 grains per hour." As a matter of fact, he contended that the local board had paid the legal price of two guineas for gas, and the duty of lighting and extinguishing, &c., had been carried out by the board. The Corporation of Southport had their own good reasons why they wished to supply, not only the public lamps, but also the inhabitants of Birkdale. They found it was for their interest to enter into the contract. The evidence of the gas manager showed that, in spite of all the disadvantages, the corporation had made, up to the present time, enormous profits. There had been no evidence to show that there would be a loss. It had been said that the profits made by the Gas Committee in 1871, 1872, and 1873 amounted to 22 or 23 per cent., but Mr. Iddon now corrected that statement, and said that he meant gross profits. Now, he asked, whoever heard anything of gross profits? Whoever expected Mr. Iddon to come forward that day, after reading his affidavit, and say they were gross profits? He wished to have some information as to what became of the profits, and who got the benefit of them, because Birkdale contributed to them in proportion. It must be remembered that all the profits went to the diminution of the rates of Southport. If they were even able to show a very small deficiency on the working of 1874-5 and 1875-6, still they must take into account the enormous benefit that the ratepayers of Southport had derived from the large profits. He then went through the figures given by Mr. Iddon, the accuracy of some of which he doubted. If they took the average price of the coal and cannel in the five contracts, they would find that, for the entire lot, it would be £1 2s. 9d. per ton. He thought that if he could show the commissioner that the corporation could make gas of the requisite illuminating power at £1 2s. 9d. per ton for all they required, without sustaining any loss whatever, he should have gone so far as to satisfy him that no Provisional Order should be made, either to reduce the quality, or to increase the price. It would have been more satisfactory if this inquiry had been held after the corporation accounts for the year had been published, which would be in about three weeks. That would have afforded some basis to go upon. If the corporation thought they were justified in this inquiry, did not the commissioner think they would have taken such a course? Was it because they had spent, in previous years, all the amount of profit they had made out of Birkdale, that the people had to pay more? Was it reasonable that because they had gone to extravagance the Birkdale people had to be charged more? Whatever they sold the site of the old works for must go towards the expenses of the new works. If the corporation found that they were really sustaining a loss, they should not have gone behind the back of the local board to the Board of Trade. If they had come and said that there was really a loss sustained, the local board might have been willing to meet them in a friendly manner; but no such information was given. If the commissioner should come to the conclusion that it was impossible for the Corporation of Southport to supply at the price of 4s. per 1000 cubic feet, with the illuminating power of 20 candles, without sustaining a loss, it was perfectly competent for him to enable them to reduce that illuminating power for both, and to increase the price in the borough of Southport, but to exclude the township of Birkdale.

Mr. *John Horn*, of Liverpool, examined by Mr. POTTER, said he had had considerable experience in the construction of gas-works, and gas engineering especially. He had gone carefully through the abstract of the corporation accounts, so far as they related to the gas accounts of 1872-3 and 1871-2. He had also heard the evidence given by Mr. Iddon and Mr. Stevenson. In his opinion there was nothing to show that there was a likelihood of a loss accruing to the corporation at the present prices and illuminating power during the next two years, but quite the contrary. He had seen the account given of the existing contracts, commencing on Aug. 19, 1873. He had worked out the average price per ton, and he made it 22s. 9d. Taking the amount of gas supplied in 1871-2, and also that supplied in 1872-3, as shown by the corporation statement, and likewise the number of cubic feet of gas per ton of coal for each of these two years, he had made a calculation, showing what the average consumption of coal during these two years would be to produce that. In making the calculation he had taken Mr. Iddon's statement for it. Taking the cubic feet per ton produced in each of the two years, and adding them together, it would give an average of 9039 cubic feet per ton. He also took Mr. Iddon's figures as to the number of cubic feet of gas supplied during the two years; and, dividing the one by the other, it gave him the quantity of coal consumed. Mr. Iddon having given no evidence as to the amount of coal consumed, he had arrived at the result of 7135 tons per annum. That was for 1871-2 and 1872-3.

Cross-examined by Mr. COCKIN: His experience of gas-works had been obtained in Glasgow and Edinburgh. He was a professional engineer, residing at Liverpool. He had erected gas-works, and kept them in order.

Mr. *James Paterson*, examined by Mr. POTTER, said he was manager of the gas-works at Warrington. He had arrived at the same results as the last witness, although by a different way. In addition to the profit of one-third upon all gas sold, there was the increase of consumption, which, upon the returns of 1872-3, would be 5½ per cent.; and he did not think they were likely to have a less increase during the next year. In the town of Warrington there was no loss sustained by supplying gas within the borough at 3s. 6d.; they had paid 10 per cent. on the old capital and 7 on the new. They were bound to supply gas of 16 candles, but they never supplied less than 18 to 20. There could be no greater difficulty in procuring coal and cannel in Southport than in Warrington. Cannel equal to producing 31 candles was very rarely to be got, and he should not like to purchase it. He should hesitate to make large extensions to the works at the present high price of material, unless it were a very pressing case; and as there was no need for more than a day's storing, there was no such necessity in Southport. He took exception to the estimate for the coal and cannel. The quantity produced by the coal and cannel was so small that he thought there must be something wrong; but, probably, that might be on account of the bad working order of the old gas-works. Now that they were putting down new works that might be altered. He gave his statement in the interest of the Corporation of Southport, when he said that 9400 cubic feet per ton should be realized. He assumed that they had a proportion of coal added to cannel to produce the illuminating power. With regard to the leakage, he thought it would amount to about 8·16 per cent. upon the total amount of gas made, and he must give great credit to the Southport management in that respect. It was the lowest leakage he knew of.

Cross-examined by Mr. COCKIN: At Warrington they supplied gas at 4s. outside the borough. They made allowances to large consumers, and they had always been able to pay good dividends. Their capital was £36,000 and £21,000, and they paid 10 per cent. on the old stock and 7 per cent. on the new. He knew cannel that would produce 31-candle gas, but such cannel was not to be obtained at the present day. The quantity of coke that could be produced upon a ton of coal depended greatly upon the quality of the coal.

In answer to further questions, *witness* said he thought the price of cannel would go down in the same ratio as coal.

Mr. *Tyrrell*, a member of the Birkdale Local Board, said he had tested the quality of the gas supplied to Birkdale. On the 29th of October, 1872, the illuminating power was 18·05; on the 15th of April, 1873, it was found to be 18·6; on the 23rd of May, 1873, it was 19; and on the 29th of August, 1873, it was 18·6. In cross-examination, he said he explained the process of testing, as he had seen it done by Mr. Iddon.

Mr. COCKIN said that on the 15th of April, 1873, Mr. Iddon had noted the gas at 26 candles.

Witness replied that it never reached 20 on any occasion.

Mr. *Horton*, meter and gas inspector for the Corporation of Liverpool, said he tested the gas at Birkdale on Saturday week, and found it 19 candles. In cross-examination, he said there should be no difference in the quality of gas after passing from the works to Birkdale. It was proved in London that gas did not deteriorate in travelling seven miles.

Mr. POTTER, in summing up, said that, presuming the illuminating power was two candles less in the distance of a mile, they got at present only 18-candle gas, whereas they were entitled to 20; and if it was proposed to drop two, Birkdale would be reduced to 16. He wished to correct a mistake into which he had fallen. He was not aware it was necessary that the application for such an order should be lodged before a given date; therefore, he found that the corporation could not, without throwing over another year, have waited to make their application for a Provisional Order until the accounts for this year had been made out. Still, they might either have asked the Board of Trade to hear their case a week or two later, after the year had expired, or they might, at no enormous amount of expenditure or trouble, have made up their accounts for three-quarters of a year, and presented a complete account, instead of furnishing a statement based on the opinion of different people. There was another matter. Under the 158th clause of the Southport Improvement Act of 1871, the money borrowed under the Act may be paid off by annual instalments within 70 years. A large amount was debited annually for the purpose of a sinking-fund. Why should this be done at this particular time? If this was a particularly arduous time for the production of gas, owing to the high price of coal, would it not be well, if they had the interests of the ratepayers and the rights of Birkdale at heart, to avoid going into this sinking-fund, and so increasing the debiting amount of the gross account. Then they would make their gas without loss.

Mr. WALTON: We are not proposing to charge the sinking-fund on the new capital.

Mr. POTTER continued: In regard to remuneration, if these works were to be wrought by municipal authorities, should they, he asked, be wrought at a profit? If the corporation thought wise to supply their own borough with gas, they did so in the belief that they could do it cheaper than any public undertaking, because what they wanted to do was to lessen their own rates, and supply consumers with gas at a low charge.

Mr. COCKIN said the Birkdale Local Board contended the corporation was making a profit, and it ought to get the benefit of it, which was a most unfair contention. The corporation did not seek to upset the arrangements embodied in the Act of 1871; they were very favourable to Birkdale, but surely outside of that they could not be asked to share their profits with that township.

The COMMISSIONER: Not to alter the arrangement?

Mr. COCKIN: Not so far as the local board are concerned—the 8d. per 1000, which was very favourable to them, operating to the extent of 6d. per 1000. Even raising the price to 4s. 6d., they would still have 6d. per 1000 of a share in the profits. They had nothing to grumble at. The real thing the case turned on was whether Mr. Stevenson's estimate was correct. It had not been attempted to be attacked by the other side, whose witnesses had gone into calculations which it was not easy to follow. He was content to rest the case on that estimate.

The learned counsel having tendered their thanks to the commissioner, the proceedings terminated.

SHEPPY GAS COMPANY.

The Annual Ordinary General Meeting of this Company was held on Tuesday, the 24th inst—Mr. JOHN COLE, chairman of the board of directors, presiding.

The report, which was read, stated that about three-fifths of the excess cost of coal during 1873 had been covered by the increased prices obtained for residuals, but that the year's profits had been reduced to a serious extent by the difference. The Sheerness Local Board of Health had elected, under the provisions of the company's Act, to adopt the "average meter" system of supply to the public lights of their district. The method of providing gas-fittings on hire, which had been carried out for the last six years, had worked very advantageously. Dividends, making up 4 per cent. for the year on the A (4 per cent. preference) shares, and 9 per cent. on the B (ordinary) shares, were recommended. The three retiring directors and the auditor offered themselves for re-election. The accounts for the year showed a gas-rental of £5668 4s. 8d.; net receipts for residuals, £1966 8s. 7d.; other sources of trade income, £125 1s. 10d. There had been expended on coals, £4156 7s. 11d.; cost of manufacture, distribution, and management, £1992 1s. 4d.; other charges on revenue, £88 4s. 10d.; interest paid, £147 10s. Profit on year's working, £1375 11s. To pay the dividends recommended it would be necessary to withdraw £144 5s. 8d. from the reserve-fund of £1800.

The adoption of the report and accounts was moved by the CHAIRMAN, and seconded by Mr. S. G. ELLIOTT.

Mr. H. JACOBS objected to the salary of the secretary (Mr. Marks), which he saw was £245 a year. He thought they could get his work done much cheaper, and nearly £5 a week was too much to pay. He also objected to drawing on the reserve-fund to pay part of the dividend. He could not understand the accounts himself—he was too much of a dunce—but he did not believe they were correct, and would like them gone over by a public accountant.

The CHAIRMAN said the secretary had for twelve years proved himself an excellent officer. When he took office the company was a much smaller affair, and it was in a great measure due to his exertions that the present prosperous position of the company had been secured. His pay was none too much for a thoroughly good servant. He was paid by a commission on the receipts, of 5 per cent. up to £100, and 2½ per cent. for the remainder. The secretary did the whole of the collecting and the office work himself. This was only the pay of an ordinary rate collector. If they wished to keep their secretary, they

must pay him what he was worth, or others would be quite ready to get him away from them. The reserve-fund was formed for the purpose of equalizing dividends when they could not earn 10 per cent., and the small sum they were about to take from it was a very proper and prudent procedure under the circumstances of the year. The accounts were quite plain and clear, and to employ an accountant, and pay him £50 or more to tell them so, would be a waste of money.

Mr. URQUHART said the secretary was, in his opinion, only fairly paid. He knew what he had to do, and how he did it, and he could only say he himself would not do the duty for the salary the secretary received.

Mr. HUDDY thought the secretary fully earned his salary, and deserved it; he wished they could give him more. He would rather not draw on the reserve-fund, and should himself be satisfied with a smaller dividend until coals were cheaper.

The CHAIRMAN said most companies had drawn on their reserve-funds this year, and some companies had nearly exhausted their reserve. He thought it was only fair dealing with those who had invested in the shares of the company to pay at least 9 per cent., if they could not pay the 10 per cent. the law allowed them to pay.

The report and accounts were then received and adopted, with only one dissentient—Mr. Jacobs.

The dividends recommended in the report of the directors were formally declared, and the three retiring directors (Messrs. Barnaby, Lockyer, and Clarkson) and the auditor (Mr. E. W. Brightman) were unanimously re-elected.

Votes of thanks to the directors, the secretary, the resident engineer, and the chairman of the meeting were unanimously passed.

A suggestion was made that the valuable services of the engineer (Mr. W. T. Carpenter) should be considered by the directors during the next year.

PROPOSED PURCHASE OF THE NOTTINGHAM GAS-WORKS BY THE CORPORATION.

A Special Meeting of the Nottingham Town Council was held on Monday March 23—the MAYOR (Alderman Howitt) in the chair—when the following report from the Gas and Water Committee was read:—

The Gas and Water Committee beg to report that they have since their last report received overtures for the purchase of the undertaking of the gas company.

Your committee have gone very fully and carefully into the present position of the gas company, and they consider that they are entitled to be paid the following annuities, namely:—

To each shareholder of a £50 share in the company, for the first seven years an annuity of £3 2s. 6d., and afterwards a perpetual annuity of £3 5s. This amounts ultimately to a premium on the present dividends paid by the gas company of 1 per cent. This is an increase on the former offer of an immediate ¼ per cent., and ultimately of ½ per cent.

The directors have agreed to the terms, and to call together a meeting of the shareholders of the company, with the view of obtaining their assent to these terms.

Your committee have also undertaken to place the terms before the Town Council for their confirmation.

The purchase includes the whole undertaking of the company, and their reserve-fund and cash due to the company, and their stock of every description.

The capital of the company bearing dividend amounts to £362,100, and they have borrowed the sum of £30,000 of their bankers, instead of raising that sum by creating dividend-bearing capital.

The corporation will have the advantage of this action on the part of the directors, as it is probable the corporation will raise that sum at 4 per cent.

The directors inform us that there is a sum of £60,000 (part of the capital of the company) invested in works which are not at present developed. As, however, the consumption of gas is steadily increasing after the rate of 9 per cent., it will not be long before this stock will be remunerative. The reserve-fund and the money owing and the stock will amount to upwards of £50,000.

There is nothing due on current accounts of any importance.

The total amount raised by the company on bonds amounts to £40,000.

The shareholders have had their full dividends for some years. The directors anticipate that the concern in the hands of the corporation will produce a profit at the end of the first year after paying the increased dividend, and a sum to be carried to a sinking-fund for ultimately extinguishing the debt.

Your committee, therefore, feel that they are justified in recommending the council to confirm the purchase of the undertaking of the Nottingham Gaslight and Coke Company on the proposed terms, and they ask to have the powers already conferred on them by the council renewed, so that they may perfect the agreement and complete the transfer to the corporation.

Mr. HEATH, chairman of the committee, in moving the adoption of the report, said it was very desirable that the completion of this matter should be attended to as soon as possible. The capital of the gas company bearing interest was £362,000, and, as the council knew, the company had power under their Act of Parliament to pay a dividend of 5½ per cent. Until a short time ago the dividend allowed was 5 per cent. and it was then raised to 5½. The price of gas was increased to some extent, the enormous rise in the price of coal rendering this step necessary. The dividend of 5½ which they had paid on their dividend-bearing capital amounted to £19,915, but in addition to that they had always paid the interest regularly on the borrowed capital. They had paid also the entire cost of the renewals of their works out of their current income, and they had never yet had to touch on their reserve-fund either for payment of the dividend or in payment for these additional works. The gas-works, as they would be aware, had been extended to districts which were permitted to be supplied with gas on a much higher sum than that which was charged to the town. The amount, therefore, of dividend, say at 6½ per cent., would be increased by the sum of £2716 per year. This would raise the dividend paying interest now and for seven years hence to the sum of £22,631, being an increase of £2716. At the end of that time, when 6½ per cent. would become payable, it would then raise £905, bringing it to £23,536. Mr. Heath went on to say they were met by the directors of the company in a very friendly spirit, and he must say that whilst anxious to do full justice to the shareholders, the directors were not unmindful of the obligation they must feel towards the town. The arrangement made was one of a very satisfactory character. There would be handed over to the corporation £17,000 actual income and £10,000 stock, and this fact was more than sufficient to justify them in asking the council to approve of the course they had taken. Setting this against the items on the other side showed that the concern was handed over, not only free from debt in every way, but such a bargain would be made as would be satisfactory alike to the shareholders, to the corporation, and the town generally. The embarrassing litigation which had taken place from time to time would now be disposed of, and he congratulated the council and the town that after many years of labour the council had at last been able to make these arrangements. He moved—"That the report of the Gas and Water Committee, now read, be received and adopted; that the council do hereby confirm the proceedings of the committee, and renew to them the powers already conferred on them by the resolution of the council of the 7th of April, 1873."

Alderman BARBER seconded the motion.

Alderman THACKERAY said they should have to set aside £8000 per year as a sinking-fund. It was a question to his mind whether they should not have either to raise the price of gas or to trespass upon the rates as they came. No doubt the works were in excellent condition, but if Lord Redesdale would not extend the period to 100 years he should advise the council to withdraw the bill. He did not see why the present generation should be taxed so heavily for the benefit of those who were to come after.

Alderman BARBER said the committee had unanimously agreed that if Lord Redesdale refused to extend the time they would recommend the bill to be withdrawn.

Mr. HEATH remarked that the time they were asking for was in excess of anything of the kind hitherto conceded by Parliament to any town in the country. The limit hitherto had been 75 years, but he sincerely hoped they should be able to get 100 years. He, for one, should be quite satisfied with 75. He thought it was long enough, and he could not see that the cutting off of 25 years would affect the town in any substantial manner.

Mr. WARD said the general feeling of the hall was that they ought to go in for 100 years. It ought to be mentioned in the minutes that they should not consent to a smaller term.

The MAYOR asked if the resolution did not cover the responsibility of the committee.

The TOWN-CLERK replied that it did, and enabled them to conclude the matter, unless some special instruction was afterwards given by the bill.

After a little discussion, Mr. BARBER said he should never consent to 50 years; and the TOWN-CLERK observed that the persons they had chiefly to contend with were the members of the Local Government Board.

The motion was then put and carried.

METROPOLIS GAS SUPPLY.

CITY OF LONDON.—At the meeting of the Common Council, on Thursday last, the town-clerk read a resolution of the vestry of the parish of St. Luke's, Middlesex, on a notification of The Gaslight and Coke Company having applied to the Board of Trade for a revision of the price of gas, and stating that the vestry object most strongly to any increase whatever in the price. The communication was referred to the Gas and Water Committee. Mr. Boor asked the Lord Mayor whether it would be convenient to his lordship to convene a public meeting in the Guildhall with regard to the price of gas in general. The town-clerk said that the Lord Mayor requested that Mr. Boor would communicate with him in private. Mr. Shaw hoped the Lord Mayor would not for one moment listen to this proposition. The matter was now before the Board of Trade Commissioners, and a report would soon be brought up by the Gas and Water Committee with reference to the result of that inquiry; and, until that took place, it was most undesirable that any such public meeting should be held.

KENSINGTON.—At the vestry meeting of this parish, on the 25th inst., a letter, enclosing a resolution passed by the Paddington Vestry, was read, having reference to the revision of the Imperial Gas Company's price, and asking this vestry to co-operate in obtaining an amendment of the law regulating appeals by the gas companies to the Board of Trade. On a motion to assent to the proposal, Mr. Freeman said the question had now become a serious one. The capital of the companies had enormously increased of late years, so that if the Metropolitan Board of Works obtained power to acquire the gas-works of the metropolis they would have to pay a very large sum. He thought it would be better to appoint a select committee to look into all the Acts of Parliament bearing upon the question, and ascertain whether it would be better to call upon the Metropolitan Board of Works to buy up the gas-works, or to go to the Home Department and set out the grievances, or to see what other steps should be taken. He moved, as an amendment, that the matter be referred to a special committee. Mr. Shaen, in seconding the amendment, said nothing short of a parliamentary committee or a Royal Commission would adequately bring out all the points of the case. Finally, it was agreed that the letter and the whole subject be referred to a special committee, to be hereafter named. The recent proceedings against the Chartered Company for an alleged nuisance at Kensal Green having been alluded to, a proposal was made that counsel should be employed to represent the vestry at the adjourned hearing on April 30, but on a division, after a long discussion, the motion was defeated.

MARYLEBONE.—At the vestry meeting, on the 26th, a motion was submitted by Professor Marks—"That the vestry of Paddington be thanked for their communication of the resolution passed at their board on Tuesday last, asking the co-operation of the vestries and district boards of London to join them in asking the Metropolitan Board of Works to buy up the present gas companies, and undertake to supply London with gas; and that they be informed that the vestry of Marylebone desire that every district board and vestry should be communicated with, in order to secure a common union of parochial action with respect to the recent increase in the price of gas." The motion, with the addition that delegates should be appointed by each vestry, was adopted unanimously.

METROPOLIS WATER SUPPLY.

Major Bolton's report on the water supplied to the metropolis during the month of February states that the condition of the river at Hampton, Molesey, and Sunbury, where the intakes of the West Middlesex, Grand Junction, Southwark and Vauxhall, Lambeth, and East London Companies are situated, was turbid and bad from the 1st to the 8th, when it improved and remained very good until the 15th, it then became bad, and was turbid and coloured for the remainder of the month. The highest flood state of the river at Hampton during the month was 2 feet 1 inch above the (6 feet) summer level, and the lowest 3 inches below. At Ditton the state of the water in the river during the month was good for 14 days, indifferent for 12 days, and bad for two days, but was much affected by the filthy and turbid state of the rivers Mole and Rye, which rendered the water of the Chelsea Company extremely difficult to filter. This company is now the only one whose intake is influenced by the highly objectionable waters of these two small but dirty rivers. The highest state of the flood water at this place was 3 feet 8 inches, and the lowest 2 inches above summer level. The highest temperature of the water during the month was 44°, and the lowest 36°, while the highest temperature of the air at the same place was 48°, and the lowest 25°. These observations were made daily at 9 a.m. The rainfall during the month was 1·32 inches, 1·08 of which fell within 24 hours on the 25th and 26th. This heavy rainfall caused a considerable rise in the river, which reached its height on the 28th, and the flood brought down large quantities of clay and marl, causing the water at the Thames intakes to become very thick and turbid. The utmost vigilance had to be exercised by the Thames companies, not having ample subsiding and storeage reservoirs, to prevent the choking up of their filter-beds after taking in bad water. The West Middlesex Company is the only one at present which, having large reservoir capacity, avoids taking in water during floods. The Lambeth Company are making large subsiding reservoirs at Molesey, and the construction of additional subsiding and impounding reservoirs by the Chelsea, Grand Junction, and Southwark and Vaxhall Companies is most desirable, so that in future when the river is in a turbid condition the flood water may be allowed to pass. The heavy rains did not in any way affect the supply of the New River and East London Companies, as their large subsiding reservoir capacity enables them to shut off the intake when floods prevail.

THE SEWAGE OF LEICESTER.

A Paper read before the Association of Municipal and Sanitary Surveyors and Engineers, on Saturday, March 14, by Mr. E. L. STEPHENS:—

"The town of Leicester extends over an area of nearly 1000 acres, containing a population of about 105,000. There are 450 streets in the town, the total length of which is about 45 miles. The greater number of the streets have a double system of sewers, the original sewers having been constructed to deliver into the river at various points on its course through the town. In 1851 an Act was obtained for the construction of a second or deep system of sewers, which has been carried out in all the streets, and being chiefly for basement or closet drainage, they are made at a minimum depth of 10 feet, varying in size from 12 to 36 inches in diameter. These sewers are all connected with main sewers

passing along the lower portion of the town, varying in depth from 10 feet to 30 feet, and in diameter from 30 to 60 inches; by these sewers the whole of the sewage is conveyed to an artificial outfall, formed by the engine well at the sewage works. The old sewers are left intact throughout the town, receiving, as previous to the construction of the new sewers, all the surface water from the streets, thus preventing the heavy *débris* from them finding its way into the deep sewers. At the various points where the new sewers pass under the old sewers, which are in each case within a short distance of the old outfalls, connexions are made between the old and new sewers to prevent the sewage entering the river; but when the junctions are gorged by storm waters the bulk passes on to the river as of old, the sewage at that time being so diluted as to be innoxious. The sewers are ventilated by various methods, the most efficient of which are numerous connexions with boiler-chimneys, which, from their great height and high temperature, form very powerful exhausts. The other modes are by pipes carried up the sides of public buildings, the downright spouts from high buildings, open ventilators in the centre of the streets, and by ventilators furnished with charcoal trays at the summit of sewers, which trays, being easily removable, serve the purpose also of flushing-places. The flushing of the sewers is effected by means of a portable waggon constructed of boiler plate, and capable of holding 1000 gallons. This waggon is furnished with a disc valve in the bottom of 12 inches diameter, below which is fixed a strong leather hose of the same diameter. The waggon is drawn over the flush, the grating and tray removed, the leather hose inserted in the mouth of the flush-pipe, the waggon filled from a hydrant fixed near, the disc valve is raised by a lever attached thereto, and the whole 1000 gallons thrown down the sewer in about two-and-a-half minutes. The sewage works are situate in the Abbey Meadow, about half a mile from the town, and were designed and constructed by the late T. Wicksteed, Esq., C.E., of London. The site contains an area of about four acres of land, on which are erected engine and boiler houses, large covered settling-tanks, lime-house, coal-house, and various other sheds, and four cottages for foreman and staff. At these works the whole of the sewage, together with a large quantity of subsoil water, amounting together to an average quantity of 5 millions of gallons per diem, is raised by steam power 20 feet into reservoirs placed at an elevation sufficient to allow the purified water to flow into the river. The steam power consists of two single-acting Cornish pumping engines, each of 20-horse power, and one rotary engine of 10 horse to drive the machinery. The Cornish engines are so constructed that at each stroke pumps are worked which mix with the sewage water a certain portion of the cream of lime, the effect of which is a rapid and perfect precipitation of all the matters held in suspension. The lime is slaked in pits constructed for the purpose, furnished with sluices, and when the lime is thoroughly slaked, it passes into circular tanks, in which agitators are fixed, which constantly rotate to prevent a deposit. It then passes to the suction-pipes of the lime pumps, which are attached to the beams of the pumping-engines, and is, as before stated, raised and mixed with the sewage in its course from the sewage pumps to the settling-tanks. The sewage thus mixed with the lime passes through settling-pits, each 20 feet long, 8 feet wide, and 10 feet deep, in which the heavy *débris* is precipitated. It thence passes through covered troughs to pits beyond, in which other agitators are kept in constant motion by the machinery engine for the purpose of more intimately mixing the lime with the sewage; from thence it passes through chequered walls into the settling-tanks. These tanks are divided into four compartments, the two first of which receive the mixed sewage on passing the chequered walls, are each 60 feet long by 45 feet wide; they are formed with sloping sides, to prevent, as far as possible, the deposit settling on them. At the bottom of these slopes, at 12 feet below the water line, inverts are formed of 3 feet diameter, in which Archimedian screws are fixed, which are driven by the machine engine; the action of which is to draw back the solid matter as it is precipitated into wells, from whence it is lifted by sets of buckets attached to endless chains to troughs on the upper portion of the buildings, whence it is delivered by gravitation into large tanks in the yard, where it lies until the supernatant water is drained off by means of open-work shafts into the engine well, and by this means and also the evaporation by the atmosphere the matters become solidified, amounting to about 4000 tons per annum, and this matter is disposed of as manure. The farther compartment of the settling tanks are each 140 feet long by 45 feet wide. They are in three divisions, the central portions being level and the sides made sloping towards the centre to facilitate the removal of the deposit. These compartments are arched over the upper surface, forming a drying-floor of 140 feet by 90 feet. The outlet for the effluent water at the north end of the settling-tanks is by weirs extending the whole width, over which it falls into a stream of pebbles and gravel resting on gratings, and thence over a series of weirs, by which means the water is further purified and aërated previous to its passing into the river. When the pump engines are overpowered by storm waters, at which times the sewage is highly diluted, the storm-water sewer constructed for that purpose is brought into action, and the storm waters are carried another quarter of a mile into the tail water of the Belgrave mill below the town, which is 7 feet below the level of the town pond, into which the greater number of the old sewers have their outfall. My explaining the various alterations which I have made on these works for their improvement during the 17 years I have had their charge, will certainly not, I think, be deemed egotistical. In the first place, the boilers were fixed at so low a level that even in flood time it was imperatively necessary to continue pumping to prevent their being flooded. To prevent this calamity, I had the boilers raised 6 feet, to lift them above flood level. I also altered their position, and placed them so that their steam chest was brought into close proximity with the cylinders, thus effecting a great saving in steam. In the next place, I found both engines pumping into one delivery-pipe. This was very costly, as it necessitated double supervision of the engine-drivers to keep the engines in a regular rotation of stroke, to prevent the two volumes of water jostling in the one pipe. This I remedied by giving to each engine a separate delivery-pipe, and by constructing large catch-pits beyond, not only to relieve their delivery, but to detain the heavy *débris* brought down with the sewage. The effluent end of the settling-tanks was originally furnished with a set of 24 sluices, all of which had to be opened and closed to meet the varied stream of sewage. Those I removed, and constructed the effluent weirs as they now exist. I have also added the gratings and gravel-screen, and constructed the catch-pits and weirs beyond, the beneficial effects of which must be patent to all. I have now in contemplation what I feel certain will be a still further improvement in the effluent water—viz., a filtering-tank of about an acre, in which I shall bar the water bearing gravel, and pass the purified water into it by the pressure of some 10 feet of head."

In answer to various questions,

Mr. Stephens stated that the 4000 tons of manure per annum was semi-dried in a portable condition. It took a year to fill a tank, and two years to dry the contents. The expense of the works was from £1800 to £2000 a year, and the loss £1400 to £1500. That did not include interest on plant. The population was about 105,000, about half supplied in water-closets. The lime used was a ton to a million gallons.

Whitehaven Gas Supply.—The following advertisement appears in a Whitehaven paper of last week:—

NOTICE IS HEREBY GIVEN by the undersigned that from and after the 31st day of MARCH next, and until further Notice, the Price of Gas to private consumers will be reduced to 10d. per thousand cubic feet.

(Signed) ALFRED PENNY, Lessee,
New Gas-Works,
WHITEHAVEN.

March 25, 1874.

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

991.—Howard, J., Camberwell, Surrey, "A new self-acting apparatus for regulating the supply of water, and disinfectant for flushing and disinfecting water-closets." March 21, 1874.

993.—Lockwood, W., Sheffield, "Improvements in valves for regulating the pressure of water or other fluids." March 21, 1874.

1002.—Smith, A., Loughborough Road, Surrey, "Improvements in the means for purifying water." March 23, 1874.

1011.—Hendrix, P. J., Zolder, near Hasselt, Belgium, "An improved process of preserving lamps, cans, and holders containing petroleum or any other explosive liquid or gas from the possibility of exploding." March 23, 1874.

GRANTS OF PROVISIONAL PROTECTION.

848.—Goodall, R., Armley, near Leeds, "Improvements in the means or method of purifying foul water or sewage, and in the apparatus employed in connexion therewith." March 7, 1874.

864.—Warner, W. J., Gas-Works, South Shields. "Improvements in the arrangement of gas-retorts and their appliances, together with apparatus and machinery for charging and discharging them." March 10, 1874.

873.—Newton, A. V., Chancery Lane, London, "An improvement in pumps." A communication. March 10, 1874.

897.—Bayley, H. D., and Bayley, G. H., Leek, Staffs, "Improvements in the construction of taps or valves, which improvements are also applicable to the fixing of glass tubes in water-gauges." March 12, 1874.

NOTICES TO PROCEED.

3607.—Soul, M. A., Leadenhall Street, London, "Improvements in self-lighting gas apparatus." A communication. Nov. 6, 1873.

3639.—Boyell, R., Birmingham, "Improvements in apparatus for regulating and controlling the flow of liquids." Nov. 8, 1873.

3663.—Ingram, J. G., Hoxton, Middlesex, "Improvements in the manufacture of flexible metal piping and tubing." Nov. 11, 1873.

3697.—Benson, M., Southampton Buildings, London, "Improvements in the method of manufacturing gases for illuminating and heating purposes, and in the apparatus employed therefor." A communication. Nov. 13, 1873.

3781.—White, W., Hampstead, Middlesex, "Improvements in the precipitation of sewage and other foul waters, and in the preparation of precipitating materials." Nov. 20, 1873.

3843.—Wirth, F., Frankfort-on-the-Main, "A new method of introducing burning gas into melting furnaces, and the apparatus employed therefor." A communication. Nov. 25, 1873.

4294.—Clark, A. M., Chancery Lane, London, "Improvements in the manufacture of gas and fuel." A communication. Dec. 31, 1873.

246.—Vaughan, E. P. H., Chancery Lane, London, "Improvements in apparatus for generating inflammable gas by the carburization of atmospheric air." A communication. Jan. 19, 1874.

205.—Newton, A. V., Chancery Lane, London, "Improvements in the mode of and apparatus for filtering, rectifying, or clarifying liquids and gases." A communication. Jan. 15, 1874.

589.—Henry, W., Leicester Square, London, "Improvements in lighting and heating with carburetted hydrogen gas." Feb. 17, 1874.

605.—Abel, C. D., Southampton Buildings, London, "Improvements in gas-motor engines." A communication. Feb. 18, 1874.

662.—West, D. K., Kentish Town, Middlesex, "Improvements in pumps." Feb. 21, 1874.

717.—Robinson, A. H., Merrion, Dublin, "Improvements in meters for measuring water and other liquids, and in motive-power engines, parts of such improvements being also applicable to flushing water-closets and preventing waste of water." Feb. 25, 1874.

733.—Somerville, J., Dublin, "Improvements in the method of manufacturing gas for lighting and heating, and for the apparatus used therein." Feb. 27, 1874.

734.—Hughes, N. H., Ayr, N.B., "A new or improved self-registering fluid or liquid measurer." Feb. 27, 1874.

766.—Beck, W. H., Cannon Street, London, "Improvements in the manufacture of illuminating gas, and in apparatus employed therein." March 2, 1874.

773.—Souchard, S. H., Paris, "Improvements in lamps, and in apparatus connected therewith." March 3, 1874.

800.—Forbes, Rev. G. H., Broughton, Northampton, "A new or improved compound for use as fuel, or for the manufacture of gas for heating and illuminating purposes, capable also of being used in the production of a material suitable for the purification of gas." March 4, 1874.

815.—Haseltine, G., Southampton Buildings, London, "Improvements in dry gas-meters." A communication. March 5, 1874.

897.—Bayley, H. D., and Bayley, G. H., Leek, Staffs, "Improvements in the construction of taps or valves, which improvements are also applicable to the fixing of glass tubes in water-gauges." March 12, 1874.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

3077.—Martin, J. W., Liverpool, "An improved tube expander and stopper." Sept. 19, 1873.

3188.—Thompson, N., Brooklyn, U.S.A., "Improvements in means for connecting together hose, tubes, and other hollow articles." Oct. 1, 1873.

3445.—Robertson, J., Nitshill, N.B., "Improvements in compressing air for burning in combination or mixture with gas or inflammable vapour." Oct. 23, 1873.

3554.—Sweet, A., Hampstead, Middlesex, "Improved mechanical arrangements for water supply purposes, whereby waste is prevented, regulation effected, and 'tremor' avoided." Nov. 1, 1873.

Cheltenham Water-Works Company.—At a recent sale by public auction the £100 stock of this company realized £181, a premium of 81 per cent. This stock the Town Commissioners, in 1864, after negotiations with the Water-Works Company, declined to purchase on security of the rates of the town, at 4½ per cent. per £100 stock, the present market value being double that amount. Since that period, the works have been under the management of Mr. M'Landsborough, C.E., the company's present engineer and manager.

Presentation to Mr. A. H. Wood, of Hastings.—The *employés* of the Hastings and St. Leonard's Gas Company—about sixty in number—assembled in the reading-room, at the works, on Thursday, the 19th inst., for the purpose of presenting a testimonial to their esteemed manager, Mr. A. H. Wood. The chair was occupied by Mr. Piper, the senior clerk, who in a most effective speech alluded to the sympathy, good feeling, and cordial understanding which had long existed between the manager and every person connected with the establishment. The testimonial consisted of a large portrait of Mr. Wood, handsomely framed, and was accompanied by a suitable illuminated address. Mr. Wood, in acknowledging the present, and expressing his gratification with the kindness and respect which it evinced, said he attributed his success in pleasing both the company and the *employés* to the one principle he had always set before him—that of endeavouring on all occasions to act with unswerving moral rectitude.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION has been AWARDED to

GWYNNE & BEALE'S PATENT IMPROVED GAS-EXHAUSTERS,

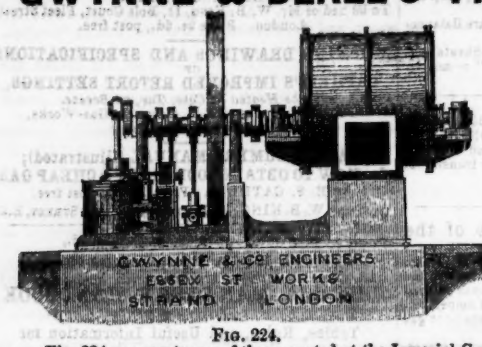

FIG. 224.

The BEST EXHAUSTERS IN THE WORLD.

Made under the personal superintendence of

Mr. BEALE,

The oldest Maker, Inventor and Patentee of

GAS-EXHAUSTING MACHINERY.

(It is NOT CORRECT to state that Mr. BEALE has RETIRED.)

Prices and every information on application.

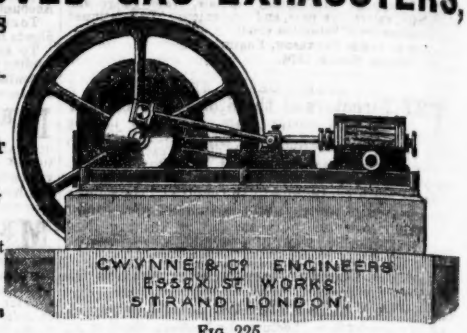

FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the most perfect system of action yet discovered. Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND Co. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the excellence of the article produced, and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES, CAN BE HAD ON APPLICATION TO

GWYNNE & CO., HYDRAULIC & GAS ENGINEERS, ESSEX STREET WORKS, STRAND, LONDON, W.C.

G. & Co. are now manufacturing for a London Gas Company three of their 210,000 *cubic feet Patent Gas Exhausters, and many of all sizes.*

WANTED, by a practical man, a situation as MANAGER of a Gas-Work, where the make is from 10 to 30 millions. Uses the photometer. Unexceptionable testimonials as to character and abilities.
Address G. L., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a re-engagement as Manager of a medium-sized Gas-Work. Excellent references as to character for careful and successful management, &c. Accustomed to accounts and collecting.
Address PHOTO, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a re-engagement as Working MANAGER of small Gas-Works. Thoroughly understands the manufacture and distribution of gas, laying services, fixing and taking meters, and fitting. Has a knowledge of retort setting. Unexceptionable reference.
Address S. E., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a situation as Assistant Gas ENGINEER or SUPERINTENDENT of a Gas-Work. Thoroughly conversant with the whole working of a Gas-Work. Is a fair draughtsman, and competent to test and analyze gas. Unexceptionable references produced.
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THE Advertiser is open for a re-engagement as Traveller, or Overlooker, Inspector, &c., in any department connected with Gas, Steam, Water-Works, or Fittings. Many years practical experience, including photometry. Well used to workmen. Town, provinces, or abroad, at a moderate salary, &c.
Address GAS AND W., Post-Office, Bloomsbury, LONDON.

WORKING MANAGER Wanted to take entire charge of a small Gas-Work. He must understand the manufacture and distribution of gas, also laying mains and services, and fixing and taking indices of meters, with a little knowledge of gas-fitting.
Address the SECRETARY of the Hornsea Gas Company, Hornsea, near HULL, with terms and references.

WANTED, by the Advertiser, aged 32, an engagement as MANAGER or MANAGER and SECRETARY of a Gas-Work. Has been 15 years connected with Gas-Works. Understands perfectly the manufacture and distribution of gas in all its branches. Can procure first-class testimonials as to ability, &c.
Address B. Z., care of Mr. William Sugg, Vincent Works, Vincent Street, WESTMINSTER.

ADVANTAGES OF GAS FOR COOKING AND HEATING,
BY
MAGNUS OHREN, A.I.C.E., F.C.S.

For Companies to issue to their gas consumers.

Specimen Copy by post 4d., direct from MAGNUS OHREN, Gas-Works Lower Sydenham, London, S.E.

VINCENT'S
PATENT IMPROVEMENTS
IN
Apparatus for Manufacturing Gas.

Particulars to be obtained by application to—
MR. LAYARD JONES,
ENGINEER,
25, OLD BROAD STREET, LONDON, E.C.

ROBUS, SIMPSON, & ROBUS,

(Late of the Crystal Palace District Gas-Works, Sydenham, and the New City Gas-Works, Montreal, Canada,)

GENERAL CONTRACTORS & RETORT-SETTERS, FITTERS & MAIN-LAYERS.

RETORTS SET ON THE LATEST IMPROVED PLAN.

Retort-Setters sent to all parts of Europe and America.

Address, J. and H. ROBUS,
BELL GREEN, CATFORD, KENT.

WANTED immediately, to hire a small second-hand GAS EXHAUSTER, with or without engine.
Apply to W. H. BECK, 139, Cannon Street, LONDON, E.C.

WANTED to purchase, 5000 to 10,000 tons of GAS COKE. Waggons can be sent to any station for any proportion of above.
Address G. J. EVERSON, Gas Coal and Coke Merchant, STOURBRIDGE.

WANTED, a gentleman of active business habits and good address, with some experience of the working and general management of Gas Companies, to act as SUB-MANAGER to the Lima Gas Company in South America. The duties will consist in a general supervision over the office, workshops, and stores, and the conduct of correspondence, &c. Minimum salary £750 per annum, with house.
For further particulars apply by letter to BATES, STOKES, AND Co., LIVERPOOL.

TO SHIPPERS OF GAS COAL.

FOR SALE—Gas Coal of the very "Highest Quality."
Apply at COATS IRON-WORKS, COATBRIDGE, N.B.

SLIDE-VALVES.

FOR SALE—14 12-in. and 5 10-in. Slide-VALVES with outside racks. They have been thoroughly re-fitted, and are equal to new. A low price will be accepted to effect a clearance.
Apply to JAMES WATSON, Engineer and Manager, Crystal Palace District Gas Company, LOWER SYDENHAM, S.E.

FOR SALE, and ready for immediate delivery by the Barnstaple Gas Company, about 35 ft. of 12-in. Hydraulic Main, in five lengths; 15 ft. of 16-in. Hydraulic Main; cast-iron Stools for ditto; 21 15-in. Mouthpieces; a number of Ascension-Pipes, Bridges, and Dips; together with a quantity of odd castings suitable for a small work.
Feb. 26, 1874.

TO GAS AND WATER COMPANIES, &c.

FOR SALE, and now in stock, 675 13-in. diameter Cast-Iron SOCKET-PIPES, in 12-ft. lengths, averaging 10 cwt. 1 qr. 21 lbs. each.
They are dipped in Angus Smith's patent composition, and are quite new and perfectly good in all particulars. Could be put f.o.b. in Tees.
Apply to F. WILLIAMS, Iron Merchant, MIDDLESBOROUGH.

CORPORATION GAS-WORKS, BARROW-IN-FURNESS.

FOR SALE—A set of Four Dry Lime PURIFIERS, 8 ft. square, four layers (wood sieves) in each, galvanized iron covers, hydraulic centre-valve, with 9-in. connexions, and lifting crane complete.
Also TWO CAST-IRON SCRUBBERS, 18 ft. high by 4 ft. diameter, top platform, with wrought-iron railings, wrought-iron ladder, 9-in. connexions, including four Donkin's valves complete.
The above are in good working order, and are only disposed of in consequence of enlargement of works.
An inspection of the above plant, and offers to purchase, will be duly considered.
Feb. 5, 1874. JOHN LEWIS, Manager.

FOR SALE, second hand, to be removed immediately, in first-class working order (at present in use at Greenock Gas-Works):—
Two Cast-Iron PURIFIERS, with wrought-iron covers and 4-tier sieves each (one with wood and one with cast iron), 14 ft. square and 5 ft. deep, with valves and connexions.
Two Cast-Iron SCRUBBERS, 7 ft. square and 16 ft. high, with 4-tier cast-iron sieves, water-distributing apparatus, connexions, and valves.
Prices, particulars, and drawing, showing arrangement of valves and connexions, on application to HANNA, DONALD, AND WILSON, Abbey Works, PAISLEY.

THE Gas Committee of the Middles- borough Corporation are prepared to receive TENDERS for a WROUGHT-IRON ROOF for Retort-House, to be delivered and fixed at the Gas-Works, Middlesborough.
Particulars can be obtained on application to the undersigned, to whom all tenders must be sent on or before the 8th of April next.
JOHN BOOTH, Jun., Manager.
March 27, 1874.

PHŒNIX GASLIGHT AND COKE COMPANY.

NOTICE is hereby given that the ADJOURNED HALF-YEARLY GENERAL MEETING of PROPRIETORS holding, previous to the 31st of December last, £300 paid-up capital and upwards in the said Company, will be held, pursuant to the Act of Incorporation, on WEDNESDAY, the 8th of April, at One o'clock precisely, at the Bridge House Hotel, in the Borough of Southwark, for the purpose of declaring Dividends to the 30th of December last, to elect Directors and Auditors for the ensuing year, and on other business.
The Transfer Books will be closed on and after the 29th inst., and opened on the 9th proximo.
By order of the Court of Directors,
ISAAC ADOLPHUS CROOKENDEN, Secretary.
70, Bankside, London, S.E., March 6, 1874.

THE Falmouth Gas Company, in consequence of alterations on their works, have for SALE 12 8-in screw wedge GAS-VALVES, in excellent condition; also, several surplus Lowmoor Iron Tank Bands (suitable for a tank 52 ft. in diameter), weighing about 5 tons.
Further particulars may be had on application to R. J. LUKEY, Secretary.
Dated Falmouth, March 28, 1874.

TAR AND AMMONIACAL LIQUOR.

THE Directors of the Shrewsbury Gas Company are open to receive TENDERS for the AMMONIACAL LIQUOR and surplus TAR produced at their works, Castle Foregate, Shrewsbury, for One or Three years, commencing on the 1st of June next.
Separate tenders under seal for the Tar and the Ammoniacal Liquor per ton, the latter advancing per degree of increased strength beyond 4° Twaddle, will be received at the Office up to the 5th day of May next.
The Directors do not bind themselves to accept the highest or any tender. By order,
S. B. DARWIN, Secretary.
Shrewsbury, March 9, 1874.

TO BUILDERS AND CONTRACTORS.

THE Directors of the Stoke Fenton and Longton Gas Company invite TENDERS for the excavating and building of a BRICK TANK, 82 ft. diameter, and 20 ft. deep, for a Gasholder.
The plans and specifications can be seen on application at the Company's Office, to the Secretary and Engineer.
Tenders to be delivered not later than the 2nd of April, endorsed "Tender for Tank."
The Directors will not bind themselves to accept the lowest or any tender. By order of the Board,
JOHN M'MILLAN, Secretary and Engineer.
Gas Office, Wharf Street, Stoke-on-Trent,
March 25, 1874.

TENDERS FOR AMMONIACAL LIQUOR.

THE Directors of the Imperial Gaslight and Coke Company, London, are open to receive TENDERS from parties willing to purchase the AMMONIACAL LIQUOR made at their several works—viz., at York Road, King's Cross, N.; Gloucester Street, Great Cambridge Street, Hackney, E.; and Sand's End Lane, Fulham, S.W. Forms of tender may be obtained from the undersigned, to whom the tenders must be sent on or before Friday, April 3.
The Directors give notice that they do not hold themselves bound to accept the highest or any tender.
By order,
HARRY CHUBB, Secretary.
Office of the Company, No. 33, John Street,
Bedford Row, London, March 21, 1874.

HYDRAULIC MAIN, MOUTHPIECES, ARCH-PIPES AND ASCENSION-PIPES FOR SALE.

THREE lengths Hydraulic Main, 7 ft. 6 in. long, 12 in. by 15 in., with 3 4-in dips in each—D shape.
1 length Hydraulic Main, 7 ft. long, 12 in. by 12 in., with 5 dips—D shape.
2 lengths Hydraulic Main, 8 ft. 6 in. long, with 6 dips in each, 12 in. by 12 in.—D shape.
24 4-in. Retort Arch-Pipes.
24 4-in. Ascension-Pipes.
12 Birch Stays.
14 Retort Mouthpieces, 14-in. by 14-in—D shape.
15 Retort Mouthpieces, 13-in. by 15-in.—D shape.
5 Retort Mouthpieces, 13-in. by 16-in.—D shape.
The above will be sold either together or separately.
Apply to Mr. H. DOULTON, Secretary to the Gas Company, HORNCASTLE,

STATION-METER.

THE Directors of the Warrington Gas Company have for sale a STATION-METER by West and Gregson, capable of passing 20,000 cubic feet per hour. Complete with clock, tell-tale, water-gauge and regulator, valves, bye-pass, and connexions. Discontinued in consequence of being too small.

Apply to JAMES PATERSON, Engineer.
Warrington, Feb. 9, 1874.

TO GASHOLDER MAKERS.

THE Directors of the Stoke Fenton and Longton Gas Company are desirous of inviting TENDERS for the erection of a Telescope GASHOLDER, 80 ft. by 78 ft. by 40 ft., in two lifts of 20 ft. each.

The plans and specifications can be seen at the Company's Office on application to the Secretary and Engineer.

Tenders to be delivered at the Offices of the Company not later than the 2nd of April next, endorsed "Tender for Gasholder."

The Directors will not bind themselves to accept the lowest or any tender.—By order of the Board,

JOHN M'MILLAN, Secretary and Engineer.
Wharf Street, Stoke-on-Trent, March 21, 1874.

SOCIETY of ARTS.—Cantor Lectures.— A course of Seven Lectures, by Professor Barff, M.A., "On Carbon and certain Compounds of Carbon, treated in reference to Heating and Illuminating," will be given at Eight o'clock on consecutive Monday evenings, commencing on April 13.

Tickets, admitting to the course, can be obtained from the Secretary, price One Guinea.—By order,

P. LE NEVE FOSTER, Secretary.
Society's House, John Street, Adelphi,
London, W.C.

Just published, price 10s. 6d.,

REGISTRATION OF DISTRIBUTORY PLANT.

The forms for this purpose are to illustrate the Paper on Distribution of Gas, read at the Edinburgh Meeting of the British Association of Gas Managers. By the use of the synopsis the whole of the out-door plant may at once be seen, with all matters pertaining to the same.

W. J. WARNER, Engineer.
South Shields.

HUTCHINSON BROTHERS,
ALBERT WORKS,
CHURCH STREET, BARNSLEY,
GAS ENGINEERS AND GENERAL COLLIERY FURNISHERS.

Plans, specifications, and estimates supplied, and contracts taken to furnish and erect Gas-Works complete, for supplying Manufactories, Collieries, Mansions, Halls, Railways, and other works.

Competent workmen sent out to town or country.

Agents for the supply of the best qualities of South Yorkshire House and Gas Coal. Prices and particulars on application.

Mr. ALFRED LASS,
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Is prepared to open the Books, and, if necessary, keep the Accounts of Gas and Water Companies.

To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.

To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

MR. WILLIAM DORE (19 years Gas Engineer and Accountant) may be CONSULTED upon all matters relating to the manufacture and distribution of gas, and the management, accounts, or transfer of gas undertakings.

Office, 4, Picton Place, Neath, SOUTH WALES.

MR. NORWOOD EARLE, late of the Dover Gas-Works, is prepared, after 17 years experience, to undertake the duties of SURVEYOR to Gas Companies and Corporations in all matters relating to the Distribution of Gas and Gas Testing. Contracts entered into for the Survey of Mains, Services, Public Lamps, &c., in order to reduce the per centage of unaccounted-for gas to the lowest possible amount.

Valuations for Assessment, Transfer, and other purposes.

Offices, MANSION HOUSE CHAMBERS, 12, Queen Victoria Street, LONDON, E.C.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

Patents procured for Foreign Countries.

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DESIGNS & PLANS of GAS-WORKS,
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DRAWINGS AND TRACINGS OF GASHOLDERS,
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Prepared with despatch, and at a moderate rate.

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To be Heated by Coke, Tar, or Breeze.

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GAS CONSUMERS MANUAL (Illustrated); Or, HOW TO OBTAIN GOOD LIGHT & CHEAP GAS.
BY E. S. CATHELS. Price 1s. 2d., post free.

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In the present edition the work has undergone careful revision, much new matter has been added, its form has been altered to suit alike the pocket and the desk, and every effort has been made to increase its usefulness, and render it worthy of the position it aspires to fill.

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J. BAILEY and Co., Albion Works, Salford, LANCASHIRE.

TO GAS COMPANIES.

PATENT FUEL AND LIME CEMENT FROM GAS LIME.

This invention (protected by three patents) consists in a new method of turning the foul lime of Gas-Works to profit. The process is very simple and inexpensive, and can be worked by Gas Companies at a very small outlay.

By simply mixing the foul lime with tar it is converted in the first instance into an excellent fuel. By burning this fuel a very valuable material for building purposes is obtained, which can be used either as lime or cement or plastic. When used as cement it will be found equal to the best Portland in durability and hardness.

Licences to work the invention will be granted by the Patentee to Gas Companies on very reasonable terms.

For further particulars apply to Mr. E. MADDOCKS, Manager of the Gas-Works, KETTERING.

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45, OXFORD STREET, LONDON, W.
MANUFACTORY AND SHOW-ROOMS:
BROAD STREET, BIRMINGHAM.
ESTABLISHED 1807.
MANUFACTURERS OF CRYSTAL GLASS CHANDELIERS,
WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.
TABLE GLASS OF ALL KINDS.
CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.

GAS PURIFICATION & CHEMICAL Co., LIMITED,

(Successors to JOHN WILLIAM O'NEILL & CO.,)

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The superiority of the material supplied by this Company is generally recognized, and it is now in use in nearly all the London and most of the large Provincial Gas-Works.

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All-Steel Charging and Stoking Shovels, Coke Screens and Forks, Steel Scoops, Picks, Mattocks, Axes, Trowels, &c.

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Corporate Mark
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SUPERIOR CAST-STEEL FILES and SAWS; Solid Cast-Steel Hand and Sledge Hammers.
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CATHELS'S Patent District Dry Gas-GOVERNOR is the only perfect self-acting contrivance for Regulating the Pressures in the higher levels of a district.

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CATHELS & TERRACE'S Patent Four-WAY DISC GAS-VALVE is the simplest and best Valve for Purifiers, and as a By-pass for other apparatus in Gas-Works. It is always gas-tight, and has no springs, ground faces, or other delicate parts. By its use the flow of the gas cannot be accidentally stopped, and it never sticks.

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BRONNER'S PATENT GAS-BURNERS give 99 per cent. of light, as compared with 27 per cent. given by ordinary burners, with equal consumption of gas.—*Vide* "Gas Referees Report," published June, 1869.

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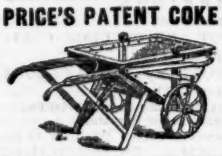

effecting a great saving of time, labour, and expense.

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(ESTABLISHED 1834.)
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Burs, Lumps, Stays, Shields, Blast Furnace and other Bricks & GAS-RETORTS.
Red and Blue Clay Goods, Engineering and other Ironwork, and Fittings supplied.
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THE PATENT CATOPTRIC LAMP
Is now in use in Moorgate Street, Cheapside, and Trafalgar Square, and has been in successful operation upon Waterloo Bridge since Oct. 7, 1871.
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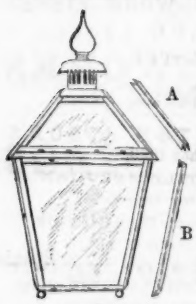

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Requiring New Street-Lamps are recommended
KEEN'S PATENT DOUBLE-CLIP STREET-LAMP.
A great improvement on the old-fashioned 14-in. Lamps.
They have been sold to various Gas-Works throughout the country and abroad, and the highest satisfactory testimonials are given as to their superiority.
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GAS-METER MANUFACTURERS, BRASSFOUNDERS & FINISHERS,
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GAS, STEAM, AND WATER FITTINGS.

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All kinds of Gas-Works Apparatus and General Castings made to Pattern or Drawing.
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INCLUDING
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Steel Coke Forks and Screens.
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Wrought-Iron Purifier Covers
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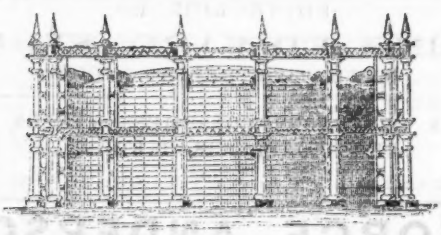

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GAS ENGINEERS & CONTRACTORS,
MANUFACTURERS OF GASHOLDERS,
GAS APPARATUS OF EVERY DESCRIPTION,
Including Improved
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N.B.—Estimates for all Gas Plant and Remodelling supplied on application.

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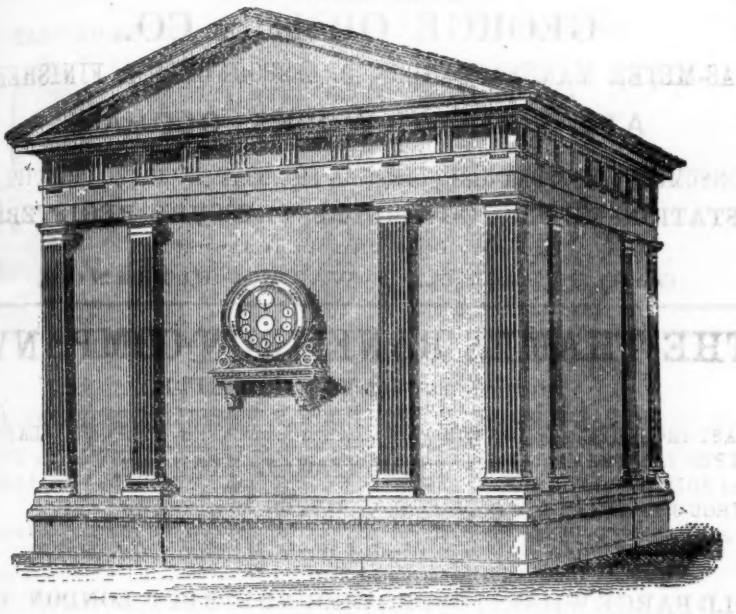
ROUND STATION-METERS,

ON CAST-IRON STANDS.



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GAS COOKING APPARATUS.

WATER-METERS SUITABLE FOR ALL PRESSURES.

Home and Foreign Orders promptly attended to.

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MR. ANDERSON advises Companies on all matters connected with the manufacture of Gas and the construction of Works.

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RETORT SETTINGS, heated by tar without the production of smoke.

STEAM-ENGINES and EXHAUSTERS, separately or combined.

FOUR-WAY VALVES, one of which is equal to three ordinary Valves.

STATION GOVERNORS—the Gasholder cannot tilt and cause accident.

BREEZE AND TAR FUEL MACHINE.

A Pamphlet containing Eighteen Illustrations of the foregoing, with letterpress on the construction of Works, post free, 2s. 6d.

N.B.—The second edition of this Work, *now ready*, contains Illustrations of the Machine for converting Breeze and Tar into Fuel for heating the Retorts.

"The Author is well qualified to speak authoritatively upon the important subjects to which his pamphlet refers."—*Artisan.*

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Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.

Warehouse in London for Cast-Iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

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BELGIAN CLAY RETORTS.

J. SUGG and CO., late ALBERT

KELLER, GHENT.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.

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WILLIAM FRASER,

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(Owner of the Works at which Fire-Clay Retorts were first made), can supply

RETORTS, FIRE-BRICKS, &c.,

to any extent.

References can be given to managers of above a hundred Gas-Works whom he supplies.

He ships at Charlestown his

CELEBRATED HALBEATH STEAM COALS,

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HARRIS AND PEARSON,

STOURBRIDGE,

Proprietors of

BEST GLASS-HOUSE POT AND CRUCIBLE CLAY;

Manufacturers of

FIRE-BRICKS, GAS-RETORTS, & FIRE-CLAY GOODS of every description.

Orders of any magnitude, for home and exportation, executed with all possible despatch.

N.B.—A quantity of Retorts in stock. Circulars, 15 in. and 16 in. Ovals, 20 in. by 14 in. D's, 15 in. by 13 in.; 16 in. by 12 in.; 18 in. by 14 in. 20 in. by 16 in.; 21 in. by 14 in.; and 24 in. by 14 in.

OXIDE OF IRON.—

We are prepared to supply, on moderate terms,

HYDRATED PEROXIDE OF IRON (BOG OCHRE),

Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.

FRANCIS RITCHIE & SONS,

BELFAST.

INTERNATIONAL EXHIBITION, 1862.

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PRIZE MEDAL

For excellence of Fire-Clay Gas Retorts, and

"HONOURABLE MENTION" for good quality of Fire-Bricks.

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GAS PURIFIERS & SCRUBBERS.

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It requires but one trial to prove the Superior Make, Strength, and Durability of these Sieves.

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DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY,

and every Article suitable for

GAS AND WATER WORKS.

CLAYTON'S PATENT SIX-WAY VALVE only requires one valve to work two purifiers; saves more than three-fourths of the connexion-pipes; requires neither tees, elbows, nor bends; no racks or springs to get out of order.
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LIMITED,
MIDDLESBOROUGH,
SUPPLY GAS & WATER PIPES of EVERY SIZE.
Plain, Turned and Bored, and Coated.
CAST-IRON RETORTS.
Castings for Gas-Works of every description.
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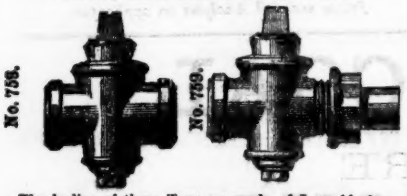
PATENT DRY GAS-METERS.
DELIVERY F.O.B. ON CLYDE.
Lists on application.

LAMBERT'S
CAST-IRON GAS-MAIN COCKS,
WITH PATENT WHITE METAL PLUGS.



The bodies of these Taps are made of Iron, black or galvanized, and the Plugs of Patent Metal. They are warranted not to set fast or corrode as do iron or brass Cocks, will always work easily, are strong, well made, durable, of little or no intrinsic value, and, therefore, not likely to be stolen; and the PRICES are (especially upon the larger sizes) FULLY 50 PER CENT. LESS THAN BRASS COCKS.
GAS-JOINTS, CHANDELIERS, PENDANTS, BRACKETS, ETC.;
WROUGHT-IRON WELDED TUBE AND FITTINGS,
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Stocks, Taps, and Dies, and Every Description of Gas-Fitters Tools; Gas Slide and Sluice Valves;
CARTER'S SAFETY GAS-VALVES;
GAS-STOVES, REGULATORS, BURNERS, &c.
Pattern-Book and Price List of Gas-Fittings, supplied on application.
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BRETTELL'S ESTATE
FIRE CLAY & BRICK WORKS,
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Manufacturers of GAS-RETORTS, GLASS-HOUSE FURNACE & BLAST-FURNACE BRICKS, LUMPS, TILES, and every description of FIRE-BRICK.
Proprietors of
BEST GLASS-HOUSE POT and CRUCIBLE CLAYS.
Successors to
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OMOA GAS COAL.

THE OMOA AND CLELAND IRON AND COAL COMPANY, LIMITED,
ARE NOW IN A POSITION TO
SUPPLY FROM THEIR PITS AT OMOA
GAS COAL
OF A VERY SUPERIOR QUALITY.
This Coal, according to the report of the analyst, yields 11,110 cubic feet of gas per ton, and has an illuminating power of 33·97 candles per 5 cubic feet per hour.
Copies of the analysis and full particulars as to price, &c., may be had on application to the SECRETARY of the COMPANY, 172, West George Street, GLASGOW.

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"UNIVERSAL" STEAM PUMP
WAS AWARDED, AT THE
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THE GRAND PRIZE "MEDAL OF PROGRESS."

OPINIONS
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"The simplest machine of its kind."—*Engineering.*

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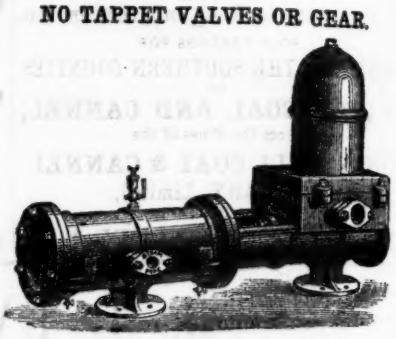


IN USE IN SOME OF
THE PRINCIPAL GAS-WORKS IN LONDON, SHEFFIELD, PENISTONE, &c.,
FOR
TAR AND AMMONIACAL LIQUORS.

One selected from amongst many Testimonials received by H. T. & Co.:—

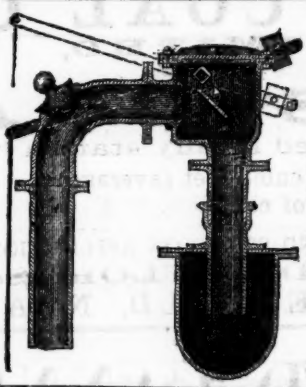
"*Ardwick Bridge Chemical Works, Manchester, Oct.* 28, 1872.

"Sir,—The 'Universal' Steam Pump obtained from you, and which has been employed during the last six months pumping caustic soda at these works, still continues working satisfactorily.

"Yours truly,

(Signed) "PETER HART, *Manager.*"

SOLE MAKERS,
HAYWARD TYLER AND CO.,
84 and 85, UPPER WHITECROSS STREET,
LONDON, E.C.



BOX'S
PATENT ANTI-DIP VALVE.

By the adoption of this Valve, which is neat, cheap, and most effective, the necessity for a dip-pipe, together with liquid, in what is now the hydraulic main, is superseded, and the pressure consequent upon the dip entirely removed, a desideratum which has been sought for by so many engineers of late.
It will be seen that the Valve can be applied direct to the existing main, but should it be desired to retain the present dip-pipes, the connexion can be easily made by inserting a flanged and spigot piece, as shown in the illustration.
Prices and any other information will be readily supplied on application to the Patentee, addressed as under—

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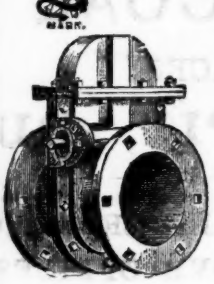
GAS-WORKS, CRAYFORD, KENT.

B. DONKIN & CO.'S
IMPROVED GAS-VALVES
WITH WROUGHT-IRON PINIONS,



List of prices, with full dimensions of all sizes up to 48-inch, to be had on application.
These Valves are all proved on both sides to 30 lbs. on the square inch before leaving the works, and are always kept in stock.
VALVES MADE WITH OUTSIDE RACKS TO ORDER.
ALSO, SCREW WATER-VALVES WITH GUN-METAL FACES.
ALSO SOLE MAKERS OF
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OF
WIGAN COAL AND CANNEL,
From the Mines of the
INCE HALL COAL & CANNEL COMPANY, Limited,
AND
Messrs. W. H. BRANCKER & Co.

CANNEL COAL.
COPPA COLLIERY, MOLD,
Beg leave to call the attention of Gas Companies to the superior quality of their
CANNEL FOR GAS-MAKING PURPOSES.
This Cannel produces in actual working, in iron retorts, 9200 cubic feet of 32-candle gas, and upwards of 11 cwt. of coke, and in clay retorts will produce 11,500 cubic feet of 25·9-candle gas.
Ports of shipment—Birkenhead or Connah's Quay.
Waggons supplied for delivery by railway to any part of England or Wales.
For particulars, prices, and rates of freight, apply to The Coppa Colliery, Mold, FLINTSHIRE.

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GAS COAL AND CANNEL
SUPPLIED BY
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MERCHANTS,
21, JOHN STREET, ADELPHI,
LONDON, W.C.
Prices Quoted on application.

THE
HUCKNALL COLLIERY COMPANY
Can offer a CANNEL COAL yielding a large quantity of Gas of superior quality.
Prices and information on application to the HUCKNALL COLLIERY COMPANY, Hucknall Torkard Collieries, near NOTTINGHAM.

POPE & PEARSON'S GAS COAL.—We have now the authority of several of the most eminent Gas Engineers of London in stating that our Coal yields *in practical working over 10,000 cubic feet of gas, with an illuminating power of 18 candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.
One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.
For further particulars, apply to POPE AND PEARSON, West Riding and Silkstone Collieries, near LEEDS.

SCOTCH CANNEL COALS.
The Subscriber is prepared to contract for the supply of all the principal SCOTCH CANNEL COALS. Prices and Analyses of the various Coals will be forwarded on application.
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Established 1840.

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173, ST. VINCENT STREET, GLASGOW.
RUSSEL'S BOGHEAD.
MUIRKIRK, No. 1, CANNEL
Yields 11,600 cubic feet of 34·3-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.
MUIRKIRK, No. 2, CANNEL
Yields 10,700 cubic feet of 32·77-candle gas per ton, and 9½ cwts. of coke, containing 11 per cent. of ash.
OLD WEMYSS CANNEL
Yields 12,550 cubic feet of 33-candle gas per ton.
Prices and full Analyses on application.

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Delivery per Rail to any Part.

ALBERT GAS COAL.
THE DERBYSHIRE
SILKSTONE COAL COMPANY,
LIMITED,
CAN OFFER A
GAS COAL
Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	10,775
Weight of coke in lbs. per ton of coal	1,465

ANALYSIS AND PRICES ON APPLICATION TO
Mr. EDMUND TAYLOR, Secretary,
ALBERT COLLIERY, NEWBOLD, NEAR CHESTERFIELD.

DUKINFIELD CANNEL COAL.
THE DUNKIRK COAL COMPANY.
OFFICES:
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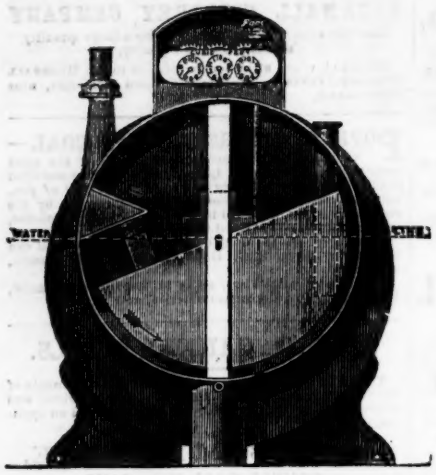

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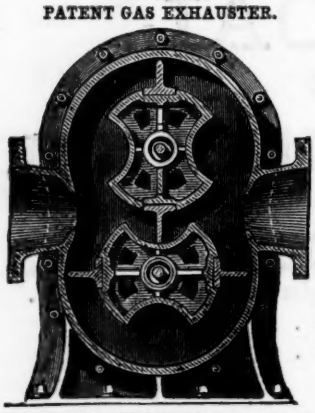

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